

The **Iron Age**

A Chilton Publication

THE NATIONAL METALWORKING WEEKLY • APRIL 7, 1955

Have
mass vacations
become a
regular habit?
See page 79

24 CONTINUOUS GALVANIZING LINES
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Written for National Carbon Company's "Carbon and Graphite News" by Charles W. Vokac, Manager, Hydro-Arc Furnace Division of the Whiting Corporation, this article evaluates the electric furnace in light of current management problems. After a brief review of major applications, it covers such topics as:

- "On-and-off" Economy
- Heat efficiency versus fuel cost
- Summary of electric furnace features as they affect distribution of fixed charges maintenance and overall plant efficiency
- Relation of temperature control to product quality
- Increased capacity and its relation to production expense
- More production per dollar of investment
- What is ahead?

There is no detailed discussion of any one phase of electric furnace operation. As a result, you get a broad, general picture of the important role the electric furnace plays in modern steel manufacture.

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Starred items are digested at the right

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NEWS DEVELOPMENTS

BUSY INDUSTRY GETS SET FOR VACATIONS — P. 79

Extended plant shutdowns were a big factor in last year's summer slump. Has the mass vacation become a permanent habit? If so, what happens to production? Answers to these questions are given in this report of the metalworking vacation picture. Management plans and union views are discussed.

REPUBLIC FINDS DIVERSE LINE PAYS OFF — P. 81

Republic Steel is riding high in the present boom. Officials attribute strong position in part to a broad product line that permits stable operations and allows the company to take advantage of rising markets. Current rush for flat rolled steel is cited as one example of a condition that found Republic ready to move.

UAW CONVENTION LAYS STRIKE GROUNDWORK—P. 82

Voting \$25 million strike fund gives UAW added card in calling a walkout. But strike talk eases after convention with hope growing for a compromise. Reuther unchallenged boss of autoworkers with own re-election and all his slate.

INDIA MAKES BID FOR STEEL BIG LEAGUE — P. 85

Expansion programs well underway point to India's emergence as a growing steel maker in the near future. Russia, England and Germany are all involved in building projects for the Indian government. Ambitious goals have been set and the nation seems on its way to a much needed industrialization.

UTILITIES MAKE BIG NUCLEAR PLANS — P. 87

Projects for nuclear produced electricity are moving out of the theory stage and going into practical planning. Utilities are making hefty budget allowances. Reactors are underway in three parts of the country. TV and radar are other uses seen for atomic power in the future.

STEEL EARNINGS GOOD DESPITE '54 SLUMP — P. 92

Steel industry earnings record in 1954 proves value of modernization and good management. Net income off only 13.2 pct despite nearly 18 pct drop in sales and operating revenue. Stockholders got a better break in dividends. Industry hoping for relief on depreciation tax. Labor peace a bright spot.

EMPLOYMENT JOINS THE BUSINESS UPTREND — P. 93

Improvement in employment conditions has not kept up with the general business recovery. But now it looks as though the turning point is here.

IN METALWORKING

ENGINEERING & PRODUCTION

STAINLESS ALLOYS FOR AIRCRAFT RATED — P. 119

Two stainless alloys exhibit the high-temperature properties required in today's high-speed aircraft. One is a modification of AISI 420 and the other a specially developed austenitic grade. The ferritic grade, 422M, has better strength at 1000° to 1100°F. The other has excellent strength at 900° to 1300°F.

HANDLING SYSTEM GIVES FULL COVERAGE — P. 124

There's a lot of materials handling done in a jet engine plant which has 53 acres of floor space. But the job is carried out with speed, efficiency and safety with a modern, versatile overhead monorail-hoist system. It accommodates all shop areas.

EXPAND USES FOR HIGH SPEED MOVIES — P. 126

Alert managements constantly find new applications for high speed photography. The technique is often used to pinpoint troubles in machines and processes. Now, it serves for training tool engineers. Product engineers use it to improve hardware items.

AIR GAGING SAVES ON SHORT RUN PARTS — P. 129

Air gaging can be applied profitably to short run production of parts. A machine tool builder installed air gages on grinders, boring mills and superfinishing equipment on a trial basis, but was soon convinced that the costs were justified. Rejects are now at a minimum, assembly problems have been simplified through better fits, and the incentive earning potential of operators has been improved.

INSTRUMENTATION CUTS PICKLING COSTS — P. 132

Modern instrumentation in pickling processes can result in acid savings of 10 to 43 pct. Not only does acid consumption decrease, but there is also a smaller volume of waste pickle liquor. Acid additions can be made faster. Such systems offer safety and convenience, and provide an accounting of acid used.

MARKETS & PRICES

KRUPP REGAINS HOLD ON WORLD TRADE — P. 84

Once convicted as war criminal, munitions heir is again a figure in world markets. His industrial empire is expanding into four continents despite setbacks at end of World War II.

ELECTRICAL SALES STAGE RECOVERY — P. 86

The general industrial recovery has juiced up the demand for heavy electrical equipment. Producers are looking for a gain in 1955 of 15-20 pct over 1954. Early cutrate sales were the order early in the year, then the big rise gathered momentum. Both utilities and industry are buying again, with utilities trying to make up for what they didn't buy in 1954.

SEASONAL FACTORS BOOST STEEL PRESSURE — P. 175

Farm, construction, oil country, and linepipe demand are injecting a seasonal bulge in the steel market picture. Meanwhile there is no sign of a letup from industries that have pushed the ingot rate to near-capacity levels. Producers and consumers are becoming more jittery over deliveries. Warehouses are being pushed for secondary material. Ingot rate will hold at high level during April.

CONSTRUCTION, FARM PRODUCT DEMAND UP—P. 176

Seasonal ordering on structurals, merchant and construction wire and reinforcing bars has stepped up. This means there's greater competition for a share of available ingots. Demand for nearly every product is tight all along the line. As a result, pressure for delivery is taxing shipping facilities of the mills.

PRICE HIKE HASN'T CURED COPPER ILLS — P. 182

Boost in copper price to 36¢ level hasn't done anything to ease the supply situation. There's still no more metal to be had at the new price than there was when the price was pegged at 33¢. Government makes 17,500 tons available to industry.

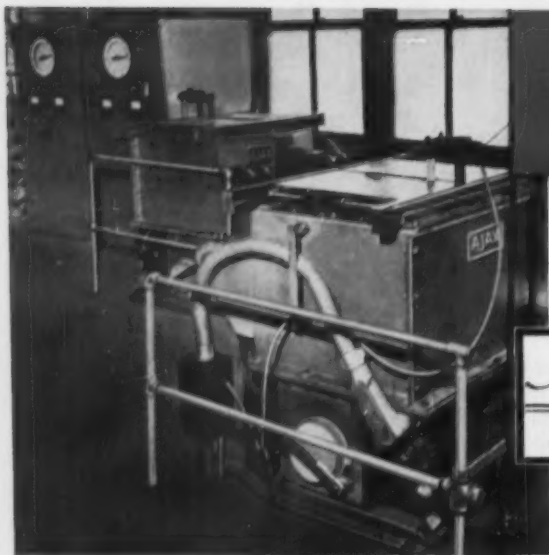
NEXT WEEK:

WELDING: SOLUTIONS TO PROBLEMS OUTLINE FUTURE

Welding's future will be tied in closely with four major fields: nuclear energy, electronics, automation and human engineering. It will be important in the first three and benefit from the fourth. Management's job will be to train welded design engineers. A fast means of evaluating weldability is one of many musts.

WHAT'S THE LONG RANGE BUSINESS OUTLOOK?

Where do we go from here? What happens this summer? And after that? Iron Age Editor Tom Campbell talks facts and figures next week, giving his analysis of the forces that will be at work in the coming months. He gives a detailed picture of what's going to happen and concrete advice on how to meet 1956.



View above shows AJAX melting furnaces, with control cabinets in background.

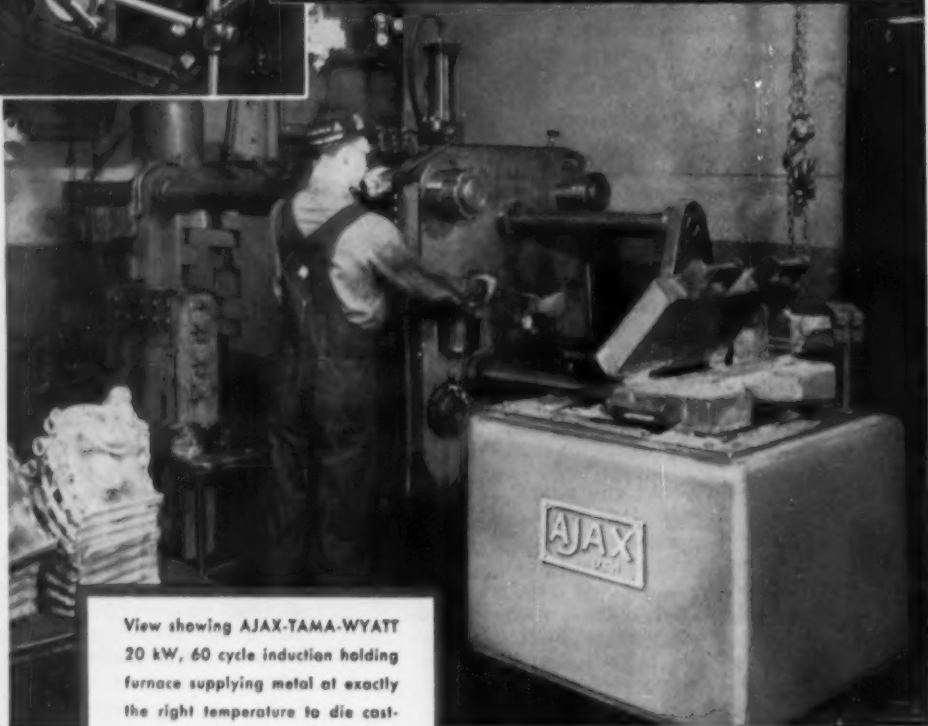
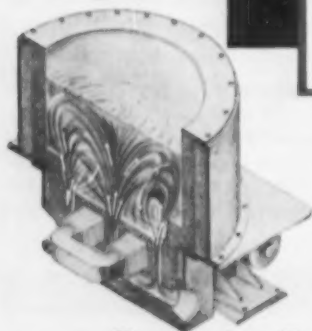
AJAX INDUCTION FURNACES

mean Higher Quality Castings for...

Advance
TOOL & DIE CASTING COMPANY
Aluminum DIE CASTINGS Zino Base

The Furnace That Stirs Itself...

The sectional view below shows the twin-coil stirring action of the 100 kW, 60 cycle AJAX Induction Furnace. Heat induced in the secondary channels below is conveyed throughout the melt by electro-magnetic circulation, as shown by the arrows.



View showing AJAX-TAMA-WYATT 20 kW, 60 cycle induction holding furnace supplying metal at exactly the right temperature to die casting machines.

Inherent stirring action of these furnaces has proved most valuable to ADVANCE TOOL & DIE CASTING CO., Milwaukee, Wisc. In full operation for 18 months, the most important results of the use of these furnaces is higher quality die cast aluminum parts. The alloy is held in uniform solution resulting in elimination of oxides, reducing

hard spot trouble in secondary machining to a negligible factor. Temperature of the melt is held at 870° F. through on-off control of the low power circuit. Working conditions are made more comfortable because of low heat losses. The units take up very little floor space.

AJAX

TAMA-WYATT



AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO-METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Worthing High Frequency Induction Furnaces
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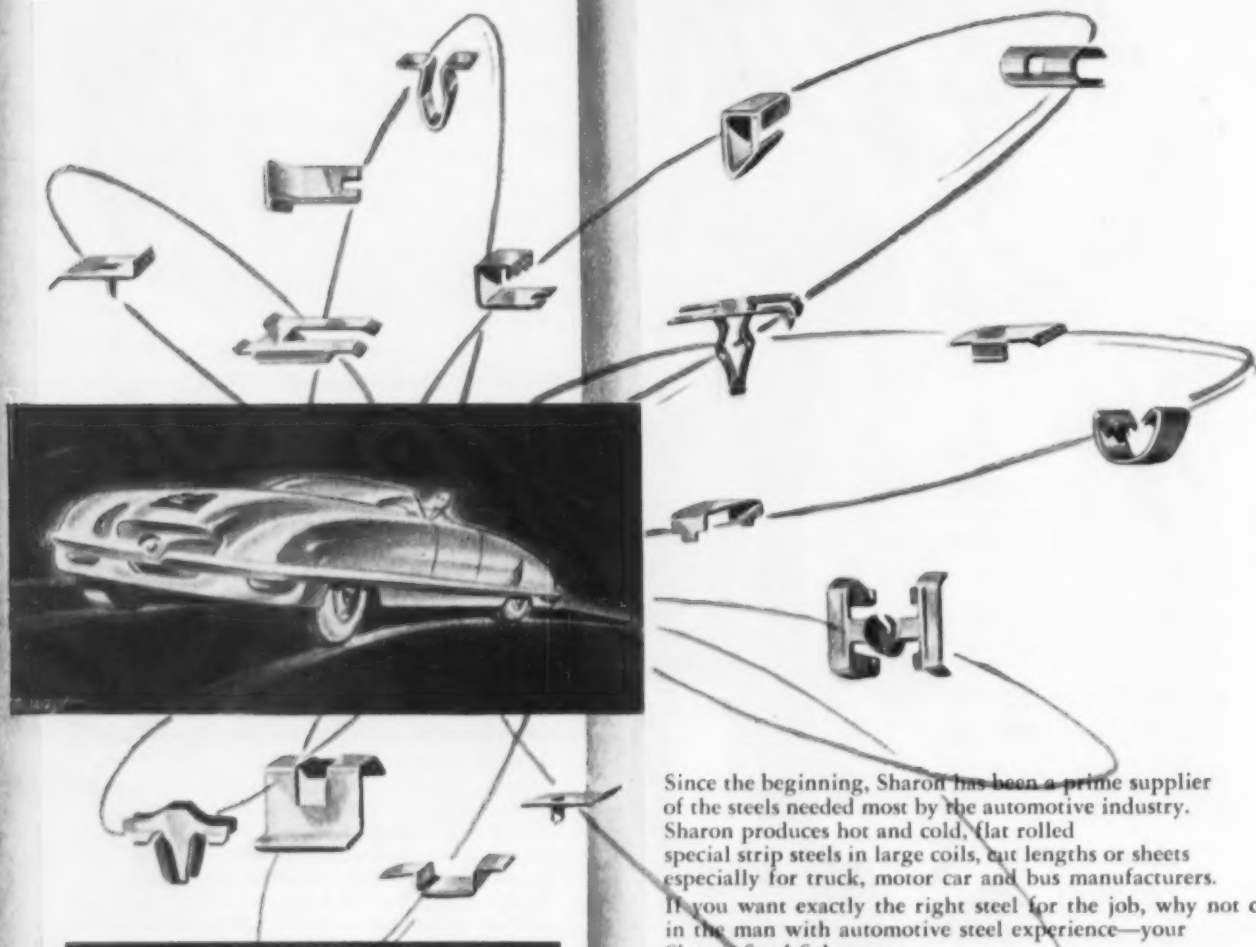
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April 7, 1955

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and the Engineering Index.



Editorial:

Why Write Editorials About...?

♦ QUITE A LOT of you people read this page. Some write letters about it, some talk to their friends about it and some say nothing to anyone. But some readers want to know why we write editorials about communism, international affairs, domestic defense problems and why we often take the temperature of the current Administration.

These readers tell us that such material is for the newspapers and not for a business paper. Of course we disagree with such a viewpoint. There is no reason why a business or a trade paper editor should not write editorials about babies (your future consumers), communism (your deadliest enemy), allies (our best friends), defense (one of our only hopes) or the Administration (the one the majority of us voted in).

Industrialists, engineers or other executives who read business papers don't always go to their newspaper for editorials. Nor do they change hats when they go from a newspaper to a magazine. They are still the same men. They are either interested or they aren't interested.

Nine chances out of ten you want to find out what effect international affairs, defense policies or governmental moves will have on your business. You also probably want to know just what part communism, Asiatic affairs and Washington events will play in your life, your family's life and the life of your company and your country.

Every editorial or opinion expressed about communism or about international affairs is written along an interpretive line of reasoning. An effort is made to connect what might seem to be a vague, far away thing to the down-to-earth relationship it has to you and your company. In this atomic age there is little that happens which does not carry an impact on our economic or industrial life.

If the times demand it, if the current thought requires it and if the news event is in the spotlight you are apt anytime to read in this column about birth control, H bombs, communism, how-to-be-an-executive, what the price of beef has to do with the Federal Reserve Board index or whether life is worth living. When you read it you can be sure it will be connected in some way with your life, your problems and your business.

Tom Campbell

EDITOR

THE

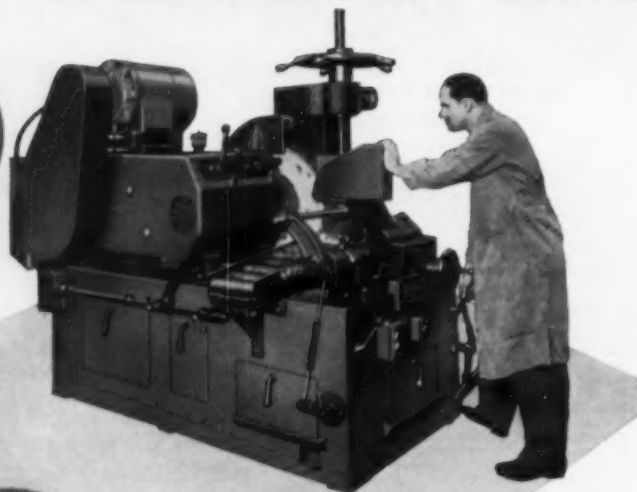


IS A

Triple-threat

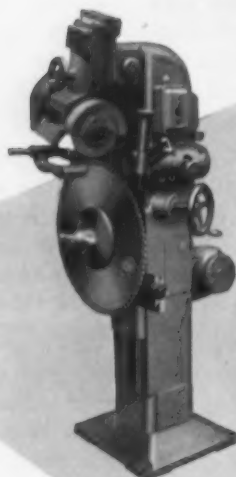
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dear editor:

Floor Armor

Sir:

We were very pleased that you were able to use the "Hexteel" story in your March 10 issue. However, we noted that you have stated, "The exposed steel surface armor is 18.15 sq in. per sq ft, and weight of the new Hexteel is 1.7 psi."

As you will note on the original news release, the weight should be 1.7 pounds per sq ft. A difference of this sort changes the description of the product considerably. *A. J. Rosenthal, Elliott, Jaynes & Baruch, Chicago.*

Indeed it does. It should have read 1.7 psf.—Ed.

Briquettes

Sir:

We are writing with reference to an article in your March 3 issue on the Newsfront page.

This article discussed the fact that future openhearth shortages may be alleviated by use of "briquettes." We would like to have further information from you regarding work that is presently being done in this field and the manufacturers who produce briquetting machines for both ferrous and nonferrous turnings. *Garson Shulman, Vice-President, I. Shulman & Son Co., Inc., Elmira, N. Y.*

Details on use of briquettes may be obtained from Pennsylvania Iron & Steel Co., 37th Ave. & A.V.R.R., Pittsburgh, Pa.—Ed.

Blast Cupola

Sir:

The March 17 issue of *IRON AGE* had an item on the Newsfront page regarding a metallurgical blast cupola which is now being used in this country to produce molten iron from 100 pct steel scrap.

letters from readers

We would appreciate your advising us the name of the manufacturer of this furnace. *M. D. Friedman, The M. D. Friedman Co., Portsmouth, Ohio.*

Details on the cupola may be obtained from the Central Iron & Steel Co., Harrisburg, Pa.—Ed.

Al-Coated Fabric

Sir:

Please advise where we may obtain information on the aluminum-coated fabric for use by workers on "hot" jobs, mentioned in *THE IRON AGE* Newsfront for Feb. 10. *R. F. Lyon, Safety Engineer, Heckethorn Mfg. & Supply Co., Littleton, Colo.*

Further information on this fabric for use in protective garments may be obtained from Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul, Minn.—Ed.

Profit from Waste

Sir:

We would appreciate receiving any additional information you may have on the new process mentioned in the item on "wastes turned to tidy profit" as described on p. 49 of your March 10 issue. *D. Reich, Librarian, Horizons, Inc., Cleveland.*

Details on this process may be obtained from Mellon-Stuart Co., 210 E. Parkway, Pittsburgh, Pa.—Ed.

Carbides

Sir:

We have been reading with a great deal of interest in the March 17 issue of *THE IRON AGE*, the writeup "Carbide Program Slashes Tool Breakage Costs."

It will be appreciated if you would send us 12 copies of this for circulation to our representatives and staff. *R. Spurr, Sales Dept., A. C. Wickman Ltd., Toronto, Ont., Canada.*

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"S.B."
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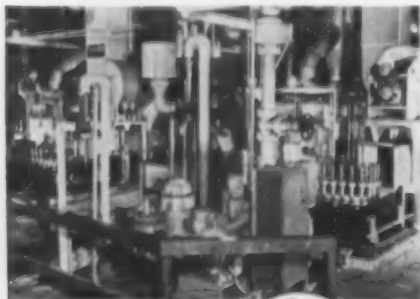


SELAS
THERMO-AUTOMATION
CUTS ANNEALING
TIME BY 94%

IN-LINE CONTINUOUS HEAT PROCESSING
STEPS UP COLD EXTRUSION OPERATIONS

Intermediate annealing of ordnance items between cold extrusion—cold forming press operations at Heintz Manufacturing Company, Philadelphia, has been reduced from 2 hours to 7 minutes per cycle, with Selas Thermo-Automation.

Selas Gradation furnaces at Heintz Manufacturing Company's new cold extrusion plant.



Selas automatic, precision-controlled heat assures metallurgical uniformity within each workpiece . . . in spite of varying cross-section . . . and reproducible uniformity from piece to piece . . . to meet rigid metal-flow requirements of cold extrusion methods. Gradation high-thermal-head furnaces occupy less floor space, and reduce inventory of work in process. Scale is virtually eliminated.

This is another example of Selas Thermo-Automation at work. This advancement in heat processing offers tremendous possibilities for savings in time, labor and money . . . and the improvement of quality in heat treating, brazing, strip annealing and other continuous operations. Write for folder entitled, "Short Cycle Annealing for Cold Extrusion of Steel".



SELAS

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fatigue cracks

\$500 Can Still Be Yours!

In a pre-Civil War editorial THE IRON AGE said "... It is yet uncertain how general or how protracted the present European War may be. It is possible that it may be confined within the borders of —, and terminated in time for the Emperor, (as he promised) to join the September Hunt, or it may involve all the powers and lead to a fearful and protracted struggle, issuing perhaps in the anarchy of revolution—perhaps in the torpor of popular defeat. The future, at this awful moment of suspense and interest, is known only to Jehovah."

Course, they didn't have the UN in those days. Don't forget! The contest isn't over! You can still help us celebrate our 100th Anniversary by sending us the oldest issue of THE IRON AGE! \$500 reward! In Money!

Exercisers Anonymous

The trouble with too many executives (and people, too) is that they have lost the fine art of relaxing. Like a traffic manager who took a much needed vacation with the old folks in the Deep South. (This comes to us from *Distribution Age*, a sister Chilton publication, and another ffj).

One afternoon he was rocking on the front porch with grandpaw when the elderly gentleman said, "Son, ef'n yo're not keerful, yo're goin' back North more tired than when you-all came."

"How come, grandpaw?"

"Wa-a-l-l. Rockin' is relaxing, but not the way you're doin' it. Rockin' agin the grain on them floorboards is tough, son. Turn your rocker around and rock with the grain—and save your strength."

We hope this will remind all members of Exercisers Anonymous

by William M. Coffey

(a cooperative movement—the purpose to help those people who can't help themselves to stay away from exercise) that with Spring in the air temptations rise and you must summon all your inner fortitude to help you through this difficult period. Domestic forces will tempt you with rakes, hoes, lawn mowers and seeds. Be firm, be resolute, be unflinching. Remember the first "NO" is twice as powerful as the second "no."

Rock with the grain.

Aptronyms

"More as a means of redeeming or resuscitating the column than from pity for the columnist," Mr. D. A. Redmond of Halifax, Nova Scotia tells us that a Mr. J. E. Rainwater is superintendent of the municipal waterworks in Cedartown, Ga., and that the town of Leakaville, N. C., floated an \$850,000 bond issue in 1952 for its water and sewer system.

Not to mention also that a book on industrial dust was written recently by Messrs. Drinker and Hatch; a book on pyrometry some time ago by Messrs. Wood and Cork; or Mathematics for Engineers, as is well known, by Messrs. Dull and Dull.

Puzzlers

Bet you didn't think anybody would get Mr. Houston's puzzler about the watch that lost its hands. But these two did, and we expected it: C. M. McKinley, and Arlan Walker, experts both. Answer: The broken-down old watch showed the correct time at exactly 164/11 minutes after 5 o'clock. Whatever happened to Professor O'Cobhthaidh of Grinnell University?

New Puzzler

What three digit number multiplied by twenty equals the square root of its cube?

PARIS in the Spring



Plan now
to attend the

MAY 14th-
MAY 30th

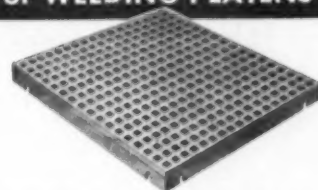
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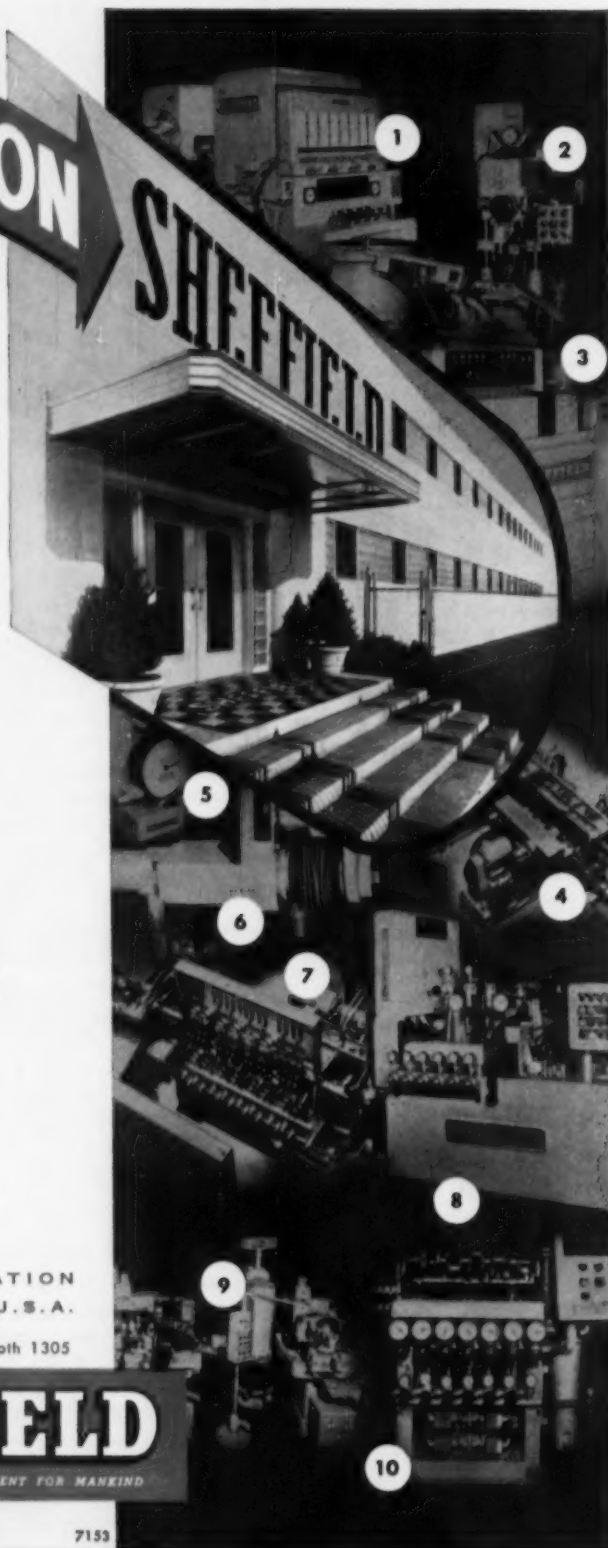


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| 1 Gaging cylinder bores for selective assembly | 5 Connecting rod inspection | 9 In-line inspection of automobile part |
| 2 Controlled heating of gear blank bores | 6 Controlling the grinding of ball bearing races | 10 Controlling 12 grinding machines |
| 3 Automatic gage for 100% inspection of small arms ammunition | 7 Post-process size control of bearing races | 4 Controlling bore size of pinion blanks |
| | | 10 Automatic gaging of crankshaft main bearings |



dates to remember

APRIL

AMERICAN HARDWARE MANUFACTURERS ASSN.—Spring meeting, Apr. 10-14, Palm Beach, Fla. Association headquarters are at 342 Madison Ave., New York.

WIRE REINFORCEMENT INSTITUTE, INC.—Spring meeting, Apr. 11-13, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at National Press Bldg., Washington, D. C.

CONCRETE REINFORCING STEEL INSTITUTE—Annual meeting, Apr. 11-16, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters are at 38 S. Dearborn St., Chicago.

EXPOSITIONS

AMERICAN MANAGEMENT ASSN.—National packaging exposition and conference, Apr. 18-21, International Amphitheatre, Chicago. Association headquarters are at 330 W. 42nd St., New York.

NATIONAL MATERIALS HANDLING EXPOSITION—May 16-20, International Amphitheatre, Chicago. Management: Clapp & Pollak, Inc., 341 Madison Ave., New York.

NATIONAL ASSN. OF PURCHASING AGENTS—Annual convention and Inform-A-Show, May 29-June 1, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Place, New York.

AMERICAN SOCIETY OF LUBRICATION ENGINEERS—Annual meeting and exhibit, Apr. 13-15, Sherman Hotel, Chicago. Society headquarters are at 84 E. Randolph St., Chicago.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Organization anniversary meeting, Apr. 16, Hoboken, N. J. Society headquarters are at 29 W. 39th St., New York.

PACKAGING MACHINERY MANUFACTURERS INSTITUTE—Semi-annual meeting, Apr. 16-17, Palmer House, Chicago. Institute headquarters are at 342 Madison Ave., New York.

AIM, OPENHEARTH BLAST FURNACE, COKE OVEN & RAW MATERIALS COMMITTEES—Annual meeting, Apr. 17-20, Bellevue-Stratford Hotel, Philadelphia. Institute headquarters are at 29 W. 39th St., New York.

SCIENTIFIC APPARATUS MAKERS ASSN.—Annual meeting, Apr. 17-21, The Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters are at 20 N. Wacker Drive, Chicago.

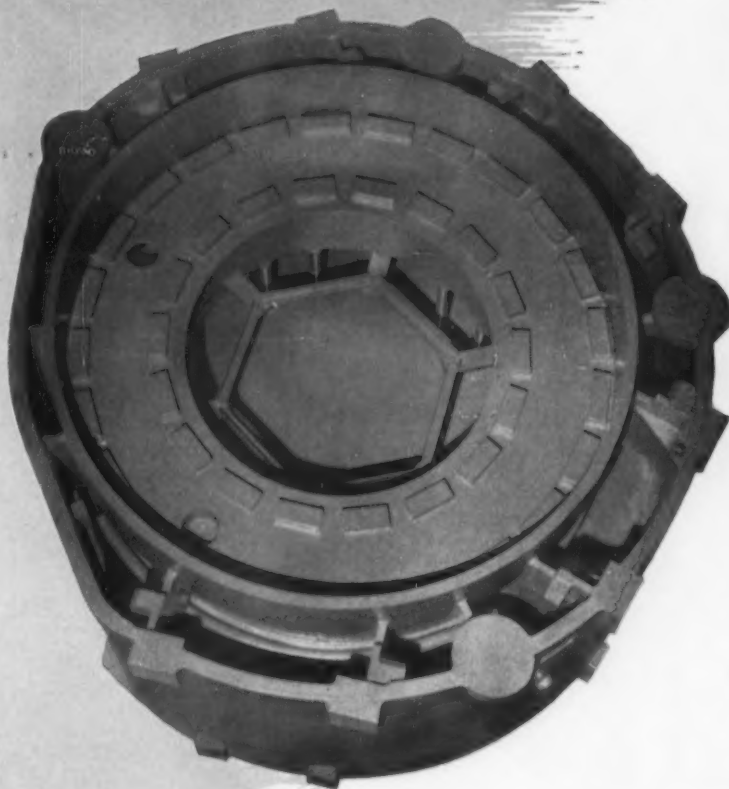
AMERICAN INSTITUTE OF STEEL CONSTRUCTION—Annual national engineering conference, Apr. 18-19, Muehlebach Hotel, Kansas City. Institute headquarters are at 191 Park Ave., New York.

BLAST FURNACE, COKE OVEN & RAW MATERIALS COMMITTEE & NATIONAL OPENHEARTH STEEL COMMITTEE, American Institute of Mining & Metallurgical Engineers—Annual conference, Apr. 18-20, Bellevue-Stratford Hotel, Philadelphia. Institute headquarters are at 29 W. 39th St., New York.

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Golden Anniversary meeting, Apr. 18-20, Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Diamond Jubilee spring meeting, Apr. 18-22, Lord Baltimore and Southern Hotels, Baltimore. Society headquarters are at 29 W. 39th St., New York.

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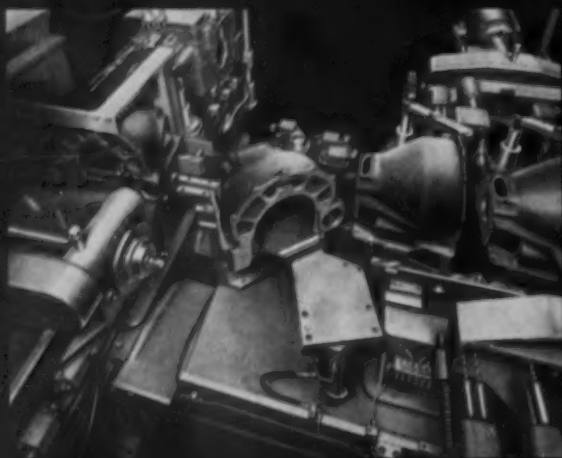
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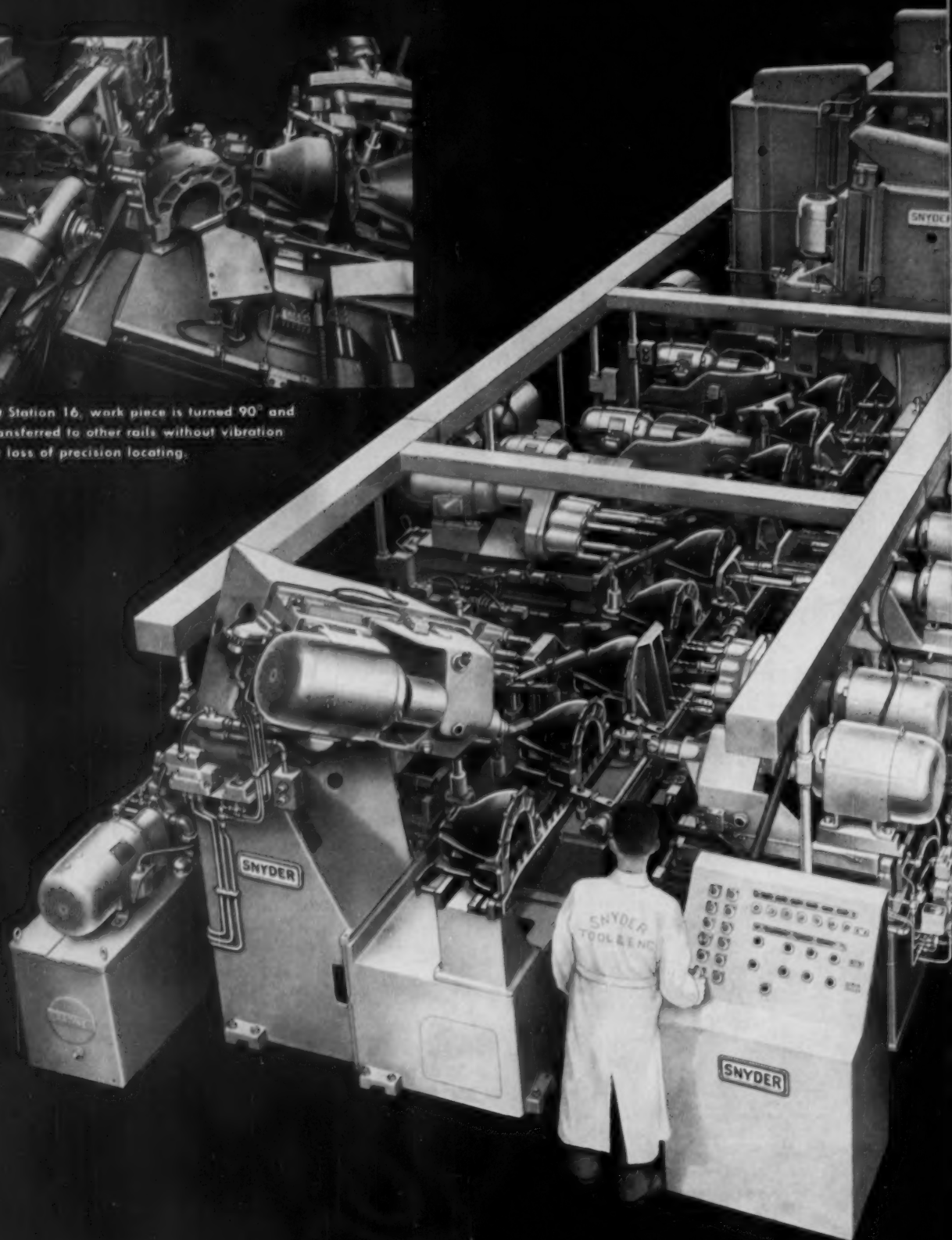
April 7, 1955

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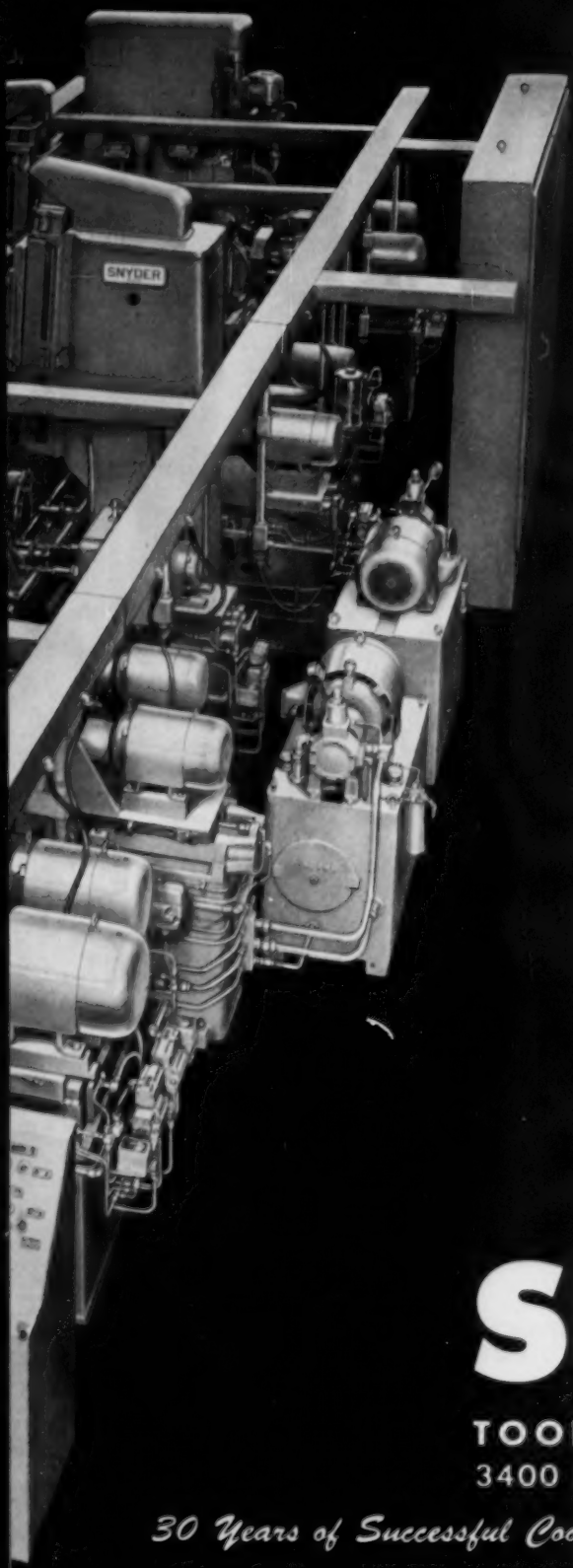
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At Station 16, work piece is turned 90° and transferred to other rails without vibration or loss of precision locating.



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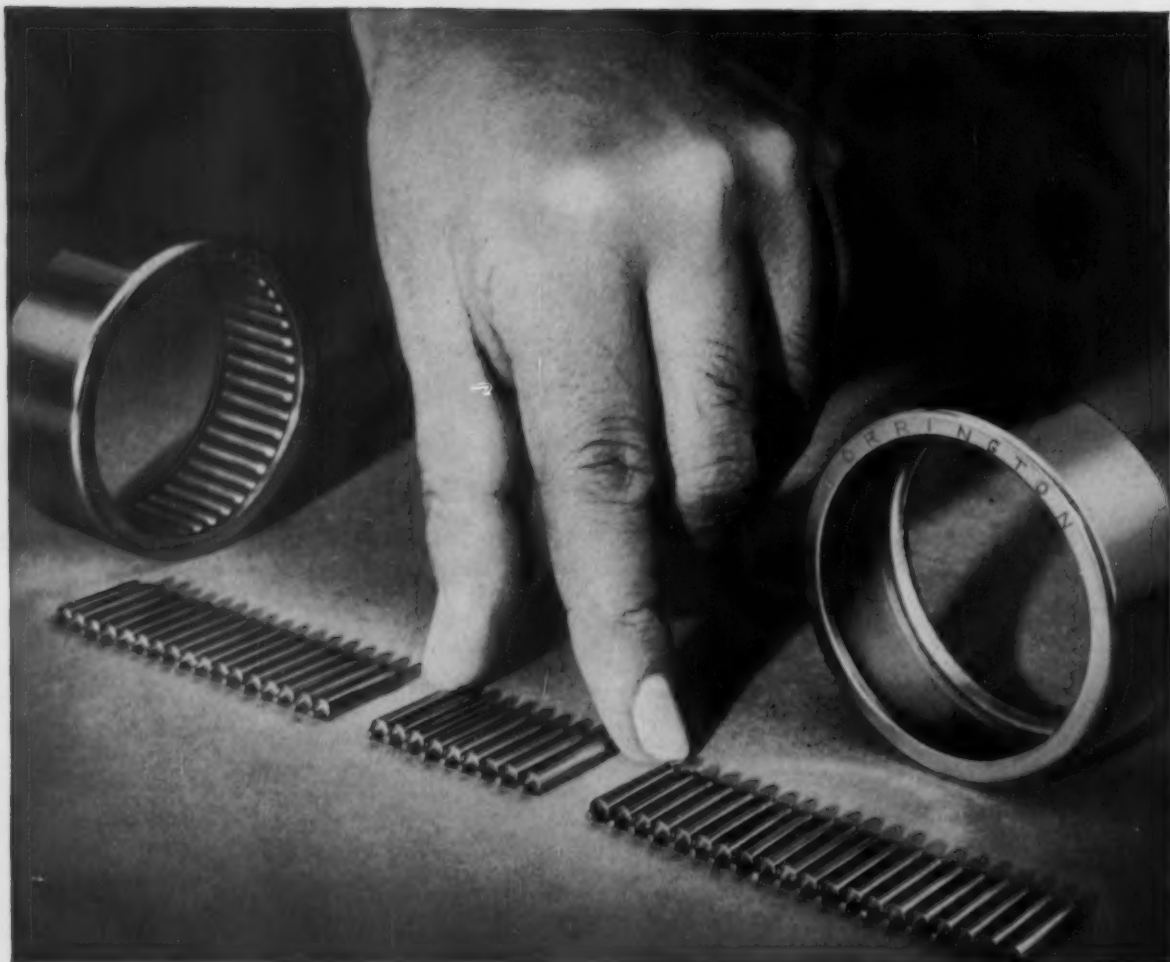
22-STATION automatic transfer machine for processing cast iron clutch housings; which drills, rough and finish bores, mills, saws, taps, spot-faces, counterbores and chamfers, performing a total of 110 operations on various surfaces or holes of various dimensions. Production, 124 cycles an hour at 80% efficiency.

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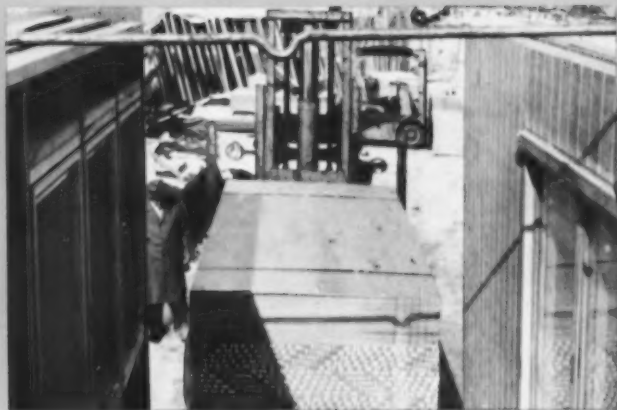
*These features make
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- Idea #439—Strapping self-palletized brick
- Idea #129—Skid loading printed material
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- Idea #123—Self-palletizing unit of concrete block
- Idea #437—Strapping and palletizing hydraulic brake drums
- Idea #409—Strapping concrete pipe on flatcars
- Idea #112—Strapping foundry flasks into bundles
- Idea #418—Wire stitching of fibreboard tote boxes
- Idea #402—Strapping rolls of tire cord fabric for overseas shipping
- Idea #434—Stitching and strapping fibre cartons for ranges
- Idea #109—Bundling and truck loading beehives
- Idea #133—Tying protective wrappings to oxygen cylinders
- Idea #408—Packaging of impregnated pipe
- Idea #167—Carload bracing coiled copper rod
- Idea #106—Skid loading cellophane rolls in cartons
- Idea #111—Bundling solid fibre newsprint cores
- Idea #420—Strapping motor trucks to freight cars
- Idea #401—Unitizing lumber for retail delivery
- Idea #415—Strapping formed, wood pipe staves in carload shipments
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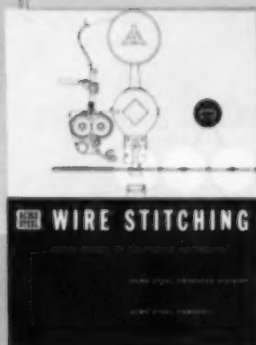
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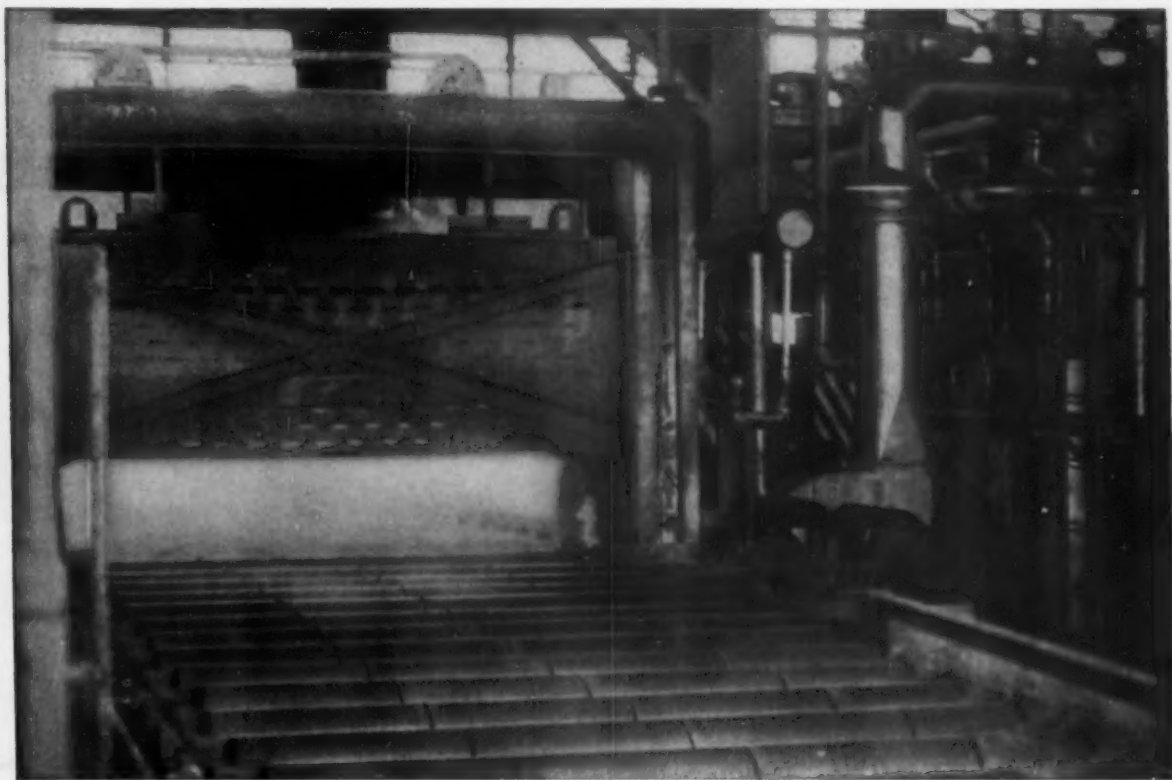
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The HASTELLOY alloy X rollers in this gas-fired heating furnace have been in use for 3800 hours. They operate in a neutral atmosphere at 2150 deg. F. They are also subjected to mechanical and thermal shock as they come in contact with the cold sheet metal being heated. A recent inspection showed that the HASTELLOY alloy X parts are still in excellent operating condition.

The rollers were fabricated from HASTELLOY alloy X sheet, $\frac{3}{16}$ in. thick. The sheets were formed into shells $7\frac{1}{2}$ in. in diameter and six feet long. The shells were then slipped over 2-in. water-cooled pipe, and refractory material was packed into the space between the

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HASTELLOY alloy X has excellent forming characteristics, and good creep and stress-rupture properties. At 1200 deg. F. this nickel-base alloy has an ultimate strength of 82,000 lb. per sq. in., and even at 1500 deg. F. the ultimate tensile strength is 48,000 lb. per sq. inch. Its outstanding resistance to oxidizing, reducing, or neutral atmospheres makes it especially useful in furnace applications.

For information on prices, sizes, and properties of HASTELLOY alloy X write to any of the district sales offices listed below.

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April 7, 1955

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Write for Shaper Catalog N-6.

*Photo courtesy Drop Dies and Forging Company,
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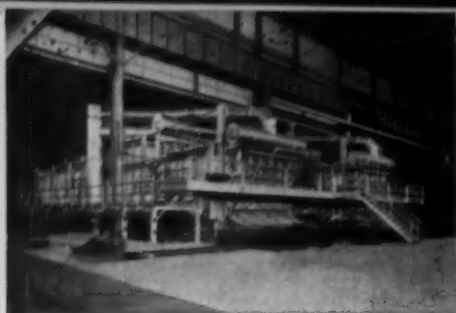
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1 One-way fired recuperative soaking pits.

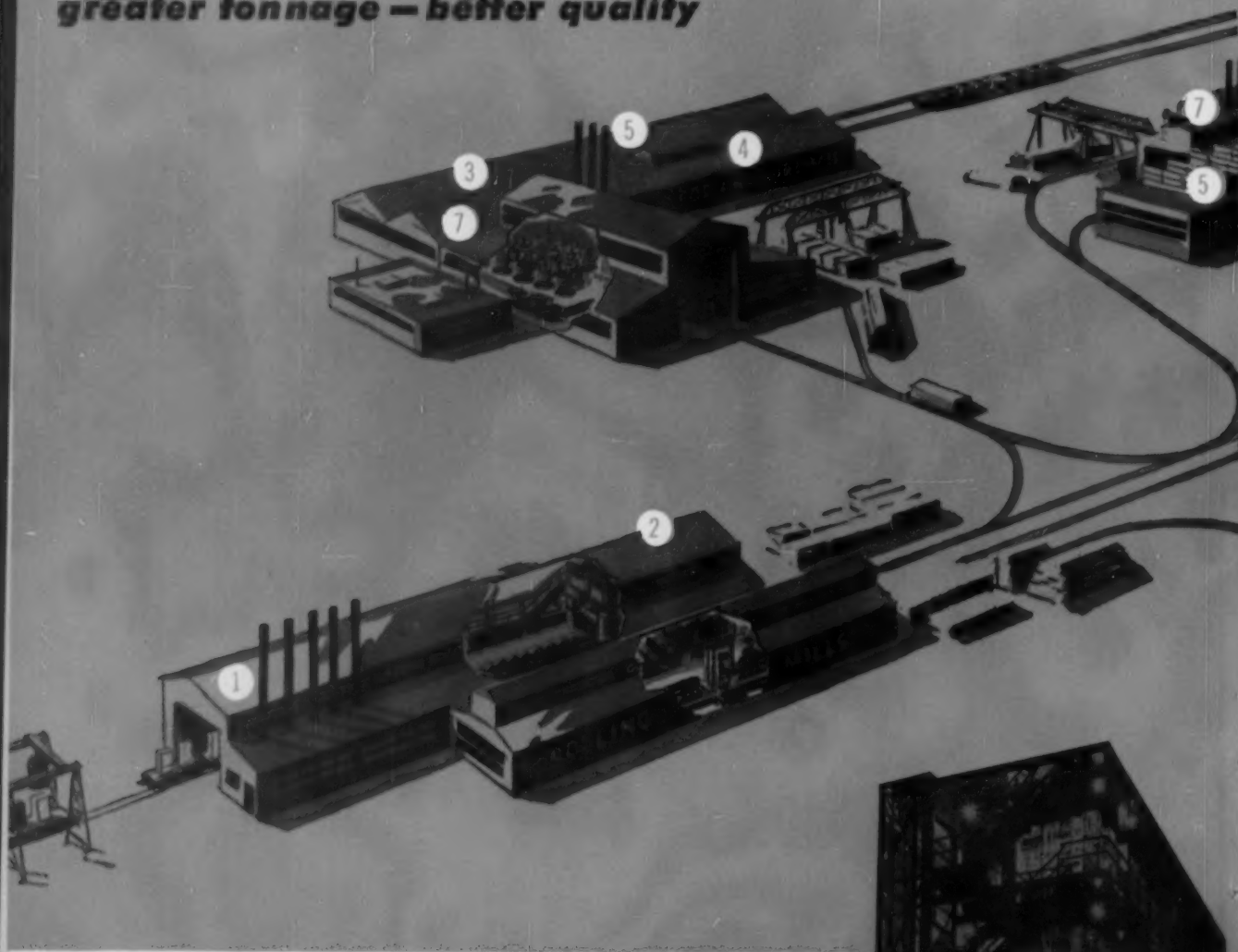


2 Continuous slab and billet furnaces.



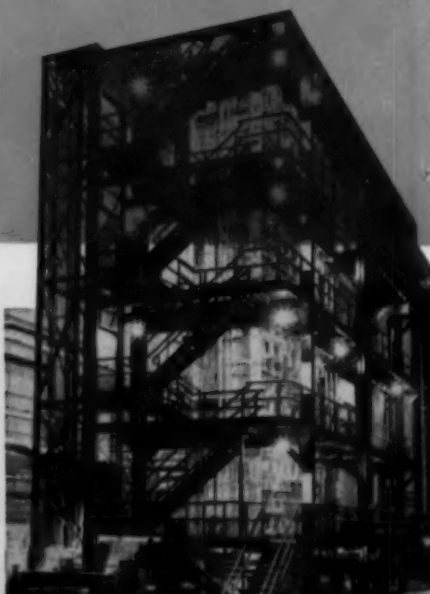
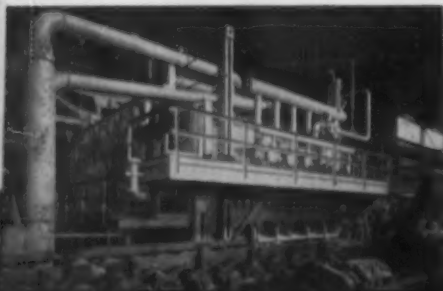
3 Continuous wire patenting furnaces.

DIVIDENDS DECLARED DAILY *greater tonnage — better quality*



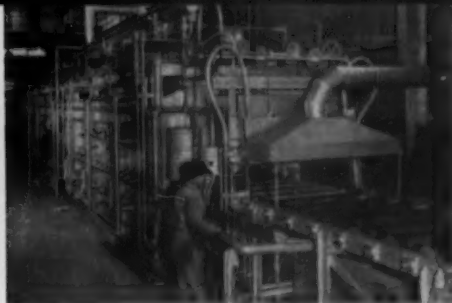
7 Continuous billet reheating furnaces.

8 Controlled atmosphere coil annealing covers.

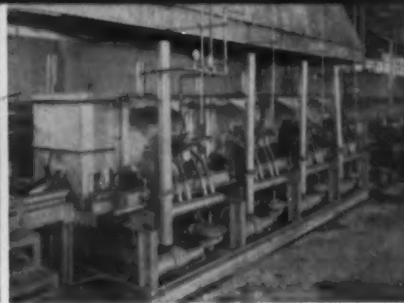




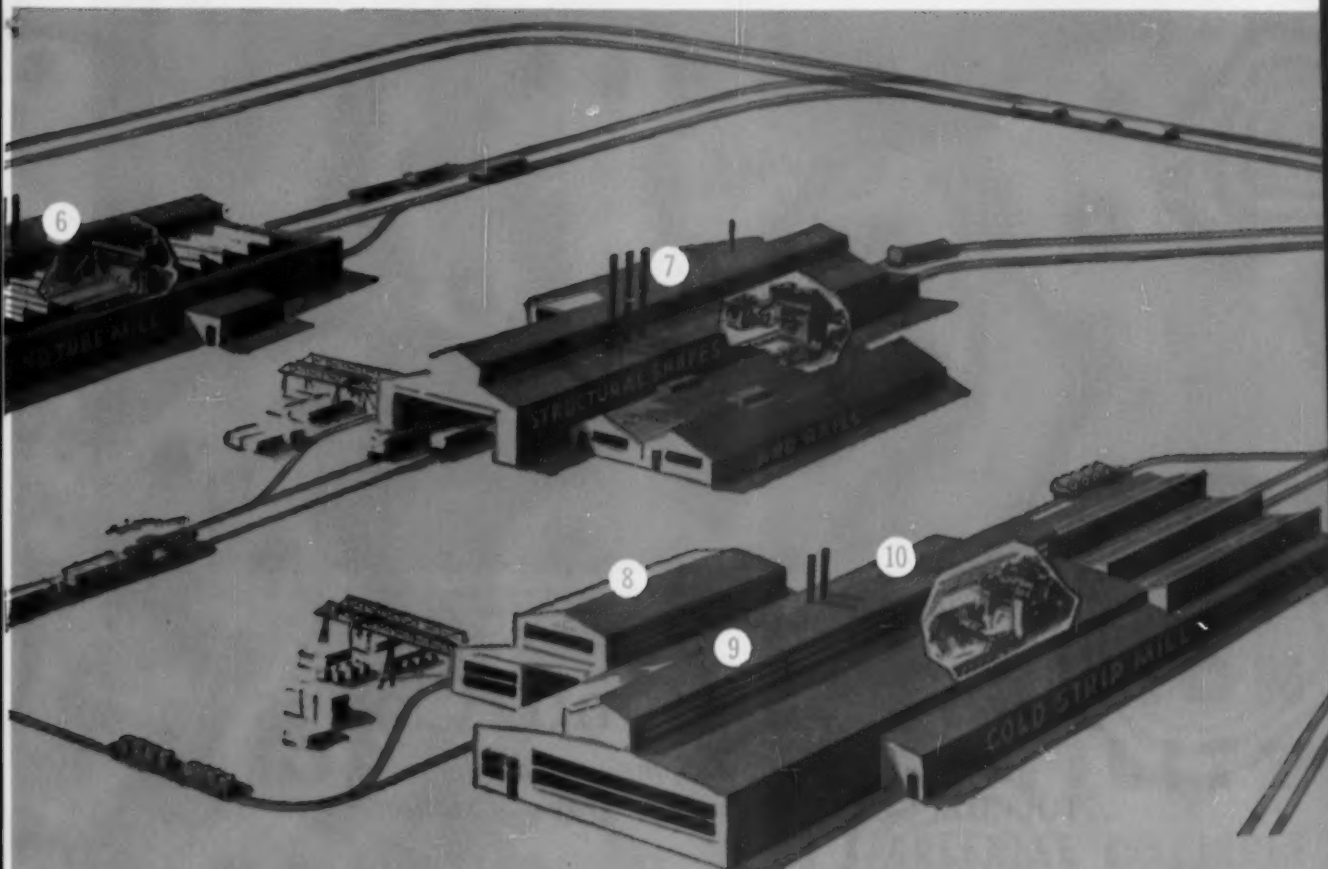
4 Pit type rod annealing furnaces.



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"Excellent cutting action. Cones lasted an average of 10 hours — longest service life we ever got."

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"For durability and cut, K Bond wheels are far the best we ever tested."

See your Norton Distributor about arranging a test of K Bond CRYSTOLON cones and wheels in your own plant. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. W-1424

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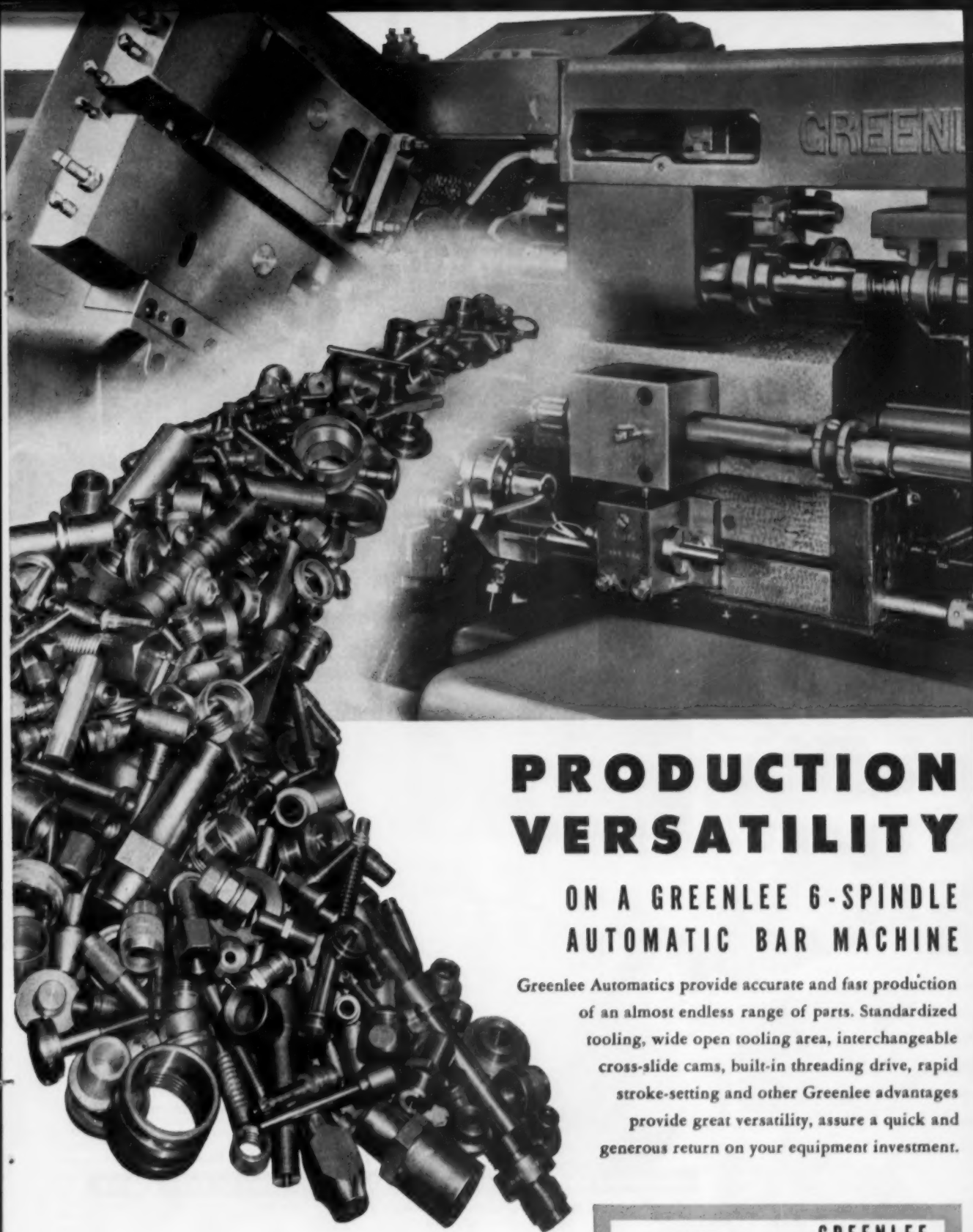


and its BEHR-MANNING division

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[†]Patent applied for

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries



PRODUCTION VERSATILITY

ON A GREENLEE 6-SPINDLE AUTOMATIC BAR MACHINE

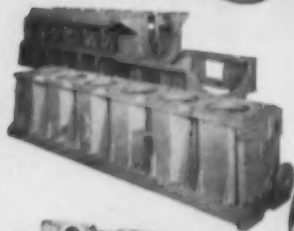
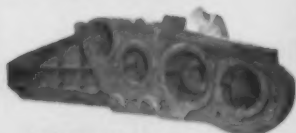
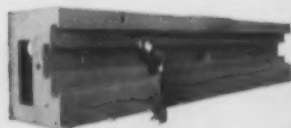
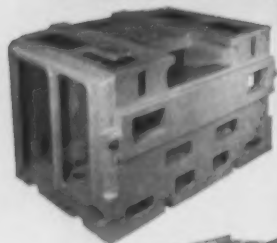
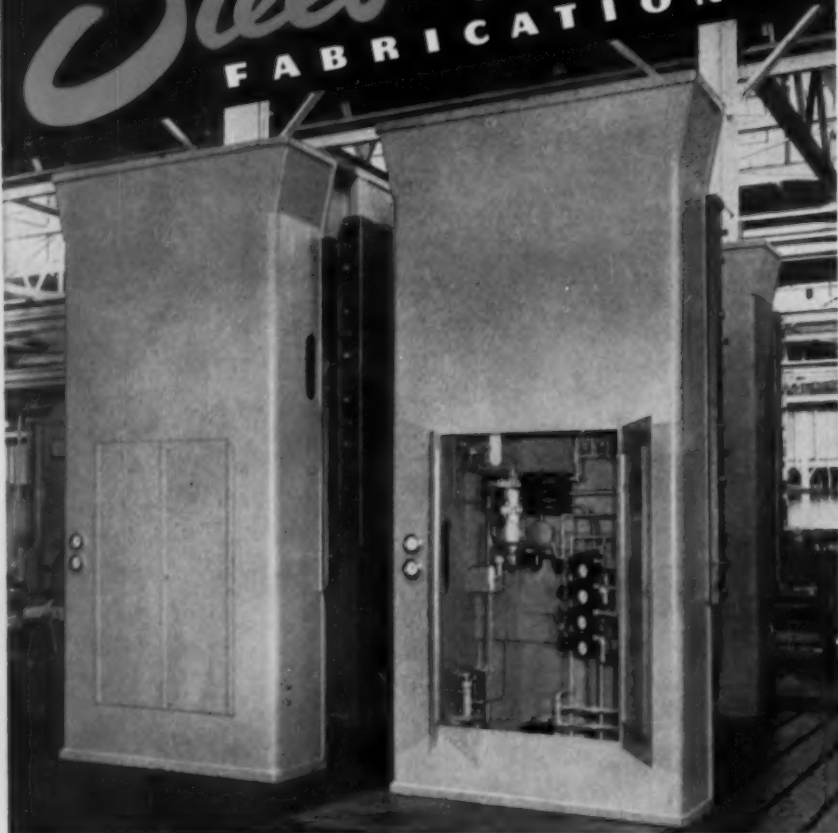
Greenlee Automatics provide accurate and fast production of an almost endless range of parts. Standardized tooling, wide open tooling area, interchangeable cross-slide cams, built-in threading drive, rapid stroke-setting and other Greenlee advantages provide great versatility, assure a quick and generous return on your equipment investment.

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FABRICATION



Use WELDED STEEL
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THE R. C. MAHON COMPANY
DETROIT 34, MICHIGAN

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

Southwest's TALLEST Building by AMERICAN BRIDGE

Republic National Bank
Building, Dallas, Texas

Architects: Harrison & Abramovitz; Gill & Harrell

Structural Engineers: Edwards & Hirth

Structural Steel Fabrication and
Erection: American Bridge



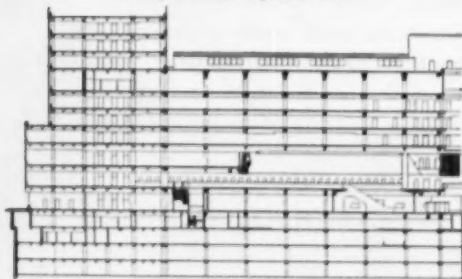
DEEP IN THE HEART OF TEXAS, looming high and handsome above an imposing skyline, the new 36-story home of the Republic National Bank of Dallas is the Southwest's tallest building.

Covering more than an acre of land in the center of the thriving metropolis, this \$25,000,000 building stands as another everlasting example of the strength and versatility of steel construction. 14,000 tons of structural steel went into its gigantic riveted frame—all of which was fabricated and erected by AMERICAN BRIDGE.

One of the interesting applications of the steel frame construction is the use of huge trusses in the bank wing's top story from which the floors above the main banking room are suspended, thus freeing the expansive, two-story main banking room of interior columns.

Your architect or consulting engineer can be relied upon to specify the type of construction best suited to your project. And AMERICAN BRIDGE has the experience, the equipment and technically skilled personnel to handle all types of steel construction with economy and dispatch — any time, anywhere. Our nearest office welcomes an opportunity to figure on your next job.

Right: Trusses on top floor of banking wing from which floors below are hung to free main banking room of columns. Below: cross section of banking wing showing 4-level underground parking floors and 2-story main banking room above ground floor.



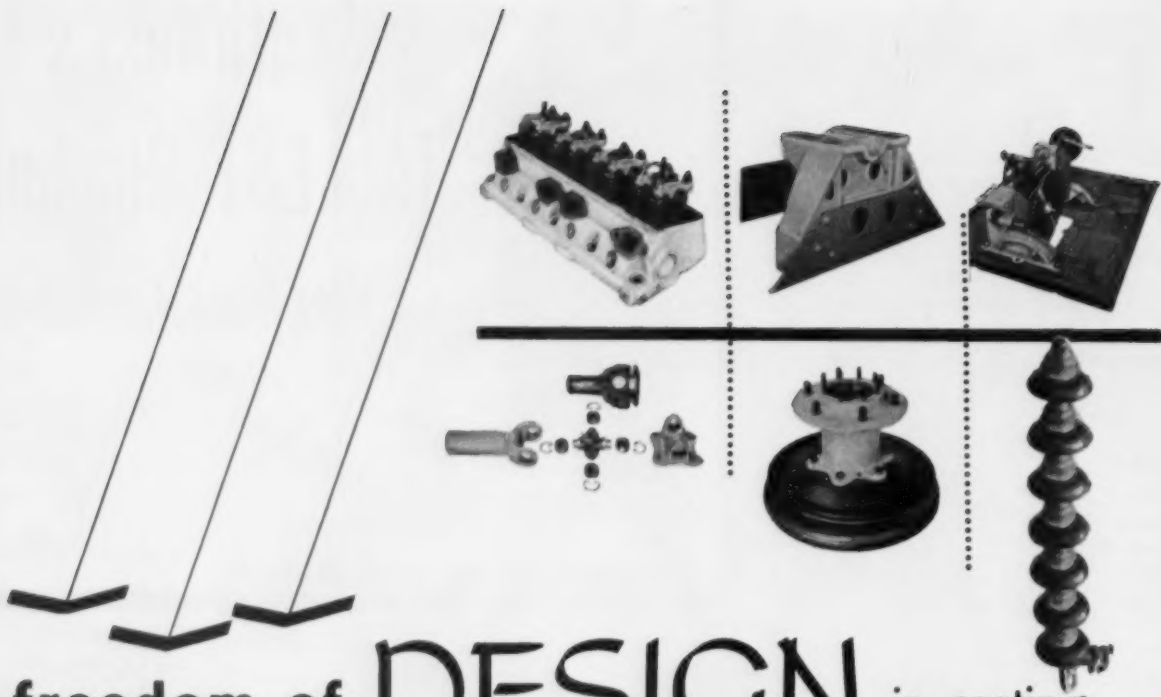
AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION
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AMERICAN BRIDGE



UNITED STATES STEEL



freedom of DESIGN in casting

MALLEABLE IRON CAN BE EASILY **cast**
 INTO THE INTRICATE SHAPES AND
 DESIGNS REQUIRED BY MODERN
HIGH PRODUCTION METHODS



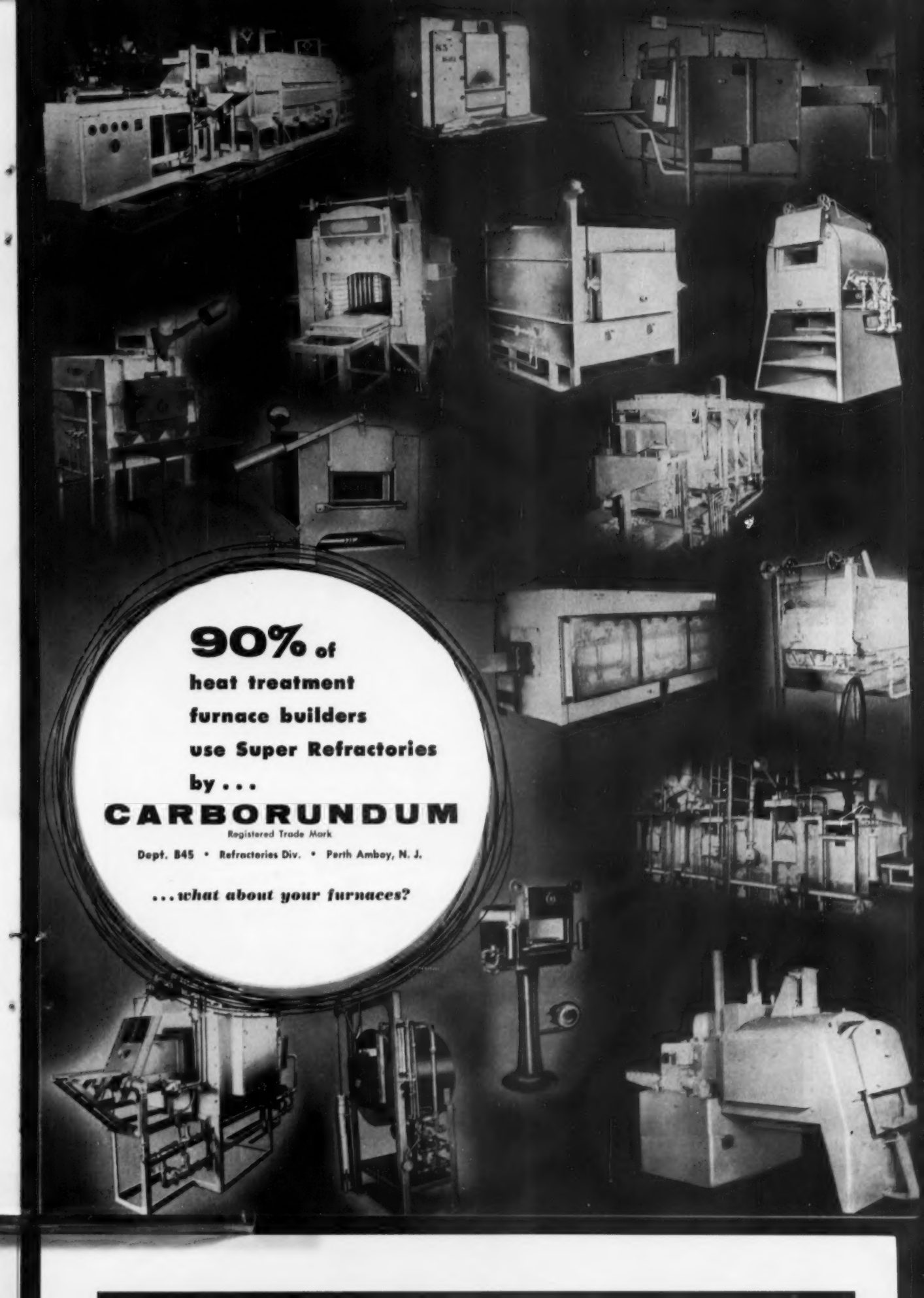
We have just one point to make . . .
 there is no engineering substitute
 for good, accurate, dependable
 castings! There is no practical way to

put metal where it is wanted . . . so accurately and at so little cost!

When it comes to the casting of ferritic and pearlitic malleable
 irons, one name means the most to the men who buy . . . Albion
 Malleable Iron . . . the foundry supplying every major requirement in
 processes, equipment and service.

Make malleable iron, the versatile metal, a part of your product.
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...what about your furnaces?

**An
Example**

OF MASS PRODUCTION METAL-WORKING MACHINERY By Waterbury Farrel



This group of "WATERBURY" Solid Die Double Stroke Headers is in operation at the Blake and Johnson Company, Waterville, Connecticut. Production rate per machine approximately 150 headed blanks per minute.

Waterbury Farrel is a recognized leader in the production of cold process bolt and nut machinery.

Yet, this is only one of several broad classifications of metal-working machinery which have spread Waterbury Farrel's reputation throughout the world. As can be seen below, the company's century of design, engineering and production

experience also includes a wide variety of Presses, Mill Machinery, Wire Making Equipment and Special Machinery.

For high speed, economical production of a vast range of metal products, industry looks to equipment by Waterbury Farrel.

WF-6

WATERBURY-FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL • COLD PROCESS BOLT AND NUT MACHINERY—Headers (all types) • Re-headers • Trimmers • Thread rolling Machines • Slotters Nut Toppers, etc. POWER PRESSES—Crank, Cam and Taggle; also Rack and Pinion Presses • Multiple Plunger Presses • Hydraulic Presses, etc. MILL MACHINERY—Rolling Mills • Wire Flattening Mills • Chain Draw Benches • Slitters and various accessory mill machinery. WIRE MILL EQUIPMENT—Continuous Fine Wire Drawing Machines (Upright Cone and Tandem) • Bull Blocks • String-up Machines • Spoolers, etc.

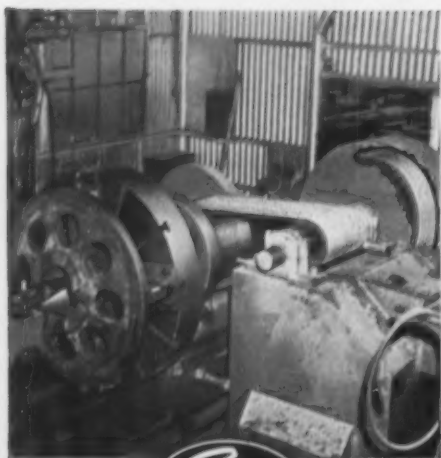
FOUNDED
WATERBURY FARREL

1851

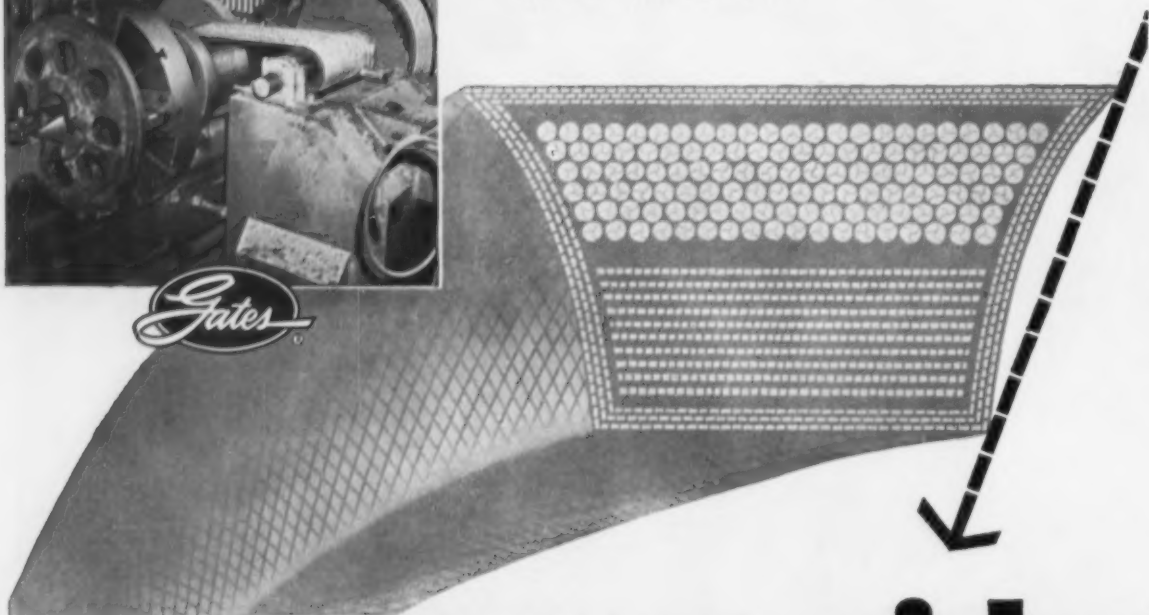
"To the success of your mechanism"



WALLACE BARNES COMPANY BRISTOL, CONNECTICUT	THE WILLIAM D. GIBSON COMPANY 1800 CLYBOURN AVE. CHICAGO 14, ILL.	RAYMOND Manufacturing COMPANY CORY, PENNSYLVANIA	BARNES-GIBSON - RAYMOND 40300 PLYMOUTH RD. PLYMOUTH, MICH.	B-G-R COOK PLANT ANN ARBOR, MICHIGAN
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The smooth, positive flow of power transmitted through Gates Vulco Ropes enables this large engine lathe to handle quickly and efficiently many tough oil field repair jobs.



How concave sides cut V-belt costs!



Fig. 1

Plants all over the world have made this discovery: Gates Vulco Ropes—the V-belts with *concave sides*—wear longer; cost less per year of service.



Fig. 1-A

Here is the interesting reason why:

When the Gates Vulco Rope is bent around the sheave, the *precisely engineered* concave sides (Fig. 1) fill out and become straight (Fig. 1-A). Thus the belt makes full, uniform contact with the sides of the pulley. You get sure pulling power and *even distribution of wear*.



Fig. 2



Fig. 2-A

It's easy to prove to yourself the value of concave sides

Simply bend a straight-sided belt (Fig. 2) and *feel* the bulge at the sides around the bend. You will quickly see why the bulging sides prevent an even fit in the pulley groove (Fig. 2-A). Uneven contact shortens belt life...increases belt costs.

Cut belt replacement time and costs...specify Gates Vulco Ropes—the V-Belt with *concave sides* (U.S. Pat. 1813698). The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-Belts*.

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TPA-30-A-G

GATES VULCO ROPE DRIVES



NEW B&W MULRAM 3200 *degree* Refractory Ramming Mix

More than two years service under tough conditions of slagging and metal penetration have proved the economy of B&W's new ramming mix, Mulram. Used to form monolithic refractory structures, B&W Mulram, which has a crushed fused-mullite base, is recommended for temperatures up to 3200 F. Its combination of low porosity and permeability, when installed, give Mulram the highest possible resistance to metal or slag penetration.

Not only is Mulram's permeability low, but it actually decreases from the hot face to the cold face. This means an *increasing* resistance to penetration through the thickness of the lining. Standard firebrick, on the other hand, have a higher and constant permeability through their thickness.

This combination of maximum resistance to slag and metal penetration and the 3200 F use limit are the chief reasons why B&W Mulram has given superior service in applications like these:

- Barium chloride salt bath furnaces
- Linings for indirect-arc electric furnaces melting iron, steel or non-ferrous metals
- Forehearth or holding ladles for gray and malleable iron
- Runners and slagging basins on continuous cupolas
- Crucible furnace walls.

Even when penetration is not a serious problem, B&W Mulram often proves economical in such applications as burner blocks or burner tunnels because of its volume stability and high hot-load strength after proper firing. Standard Mulram is made in 4-mesh size, wet or dry form (Mulram 4W and 4D). Other mesh sizes are available for special applications. Call or write your local B&W Refractories Engineer for complete information.



B&W Mulram is being rammed into the bottom of this salt bath furnace. Furnace walls are formed with B&W Mulram, backed up by B&W's 3000 degree castable, Kaocast, and insulated with B&W K-20 Insulating Concrete Mix.

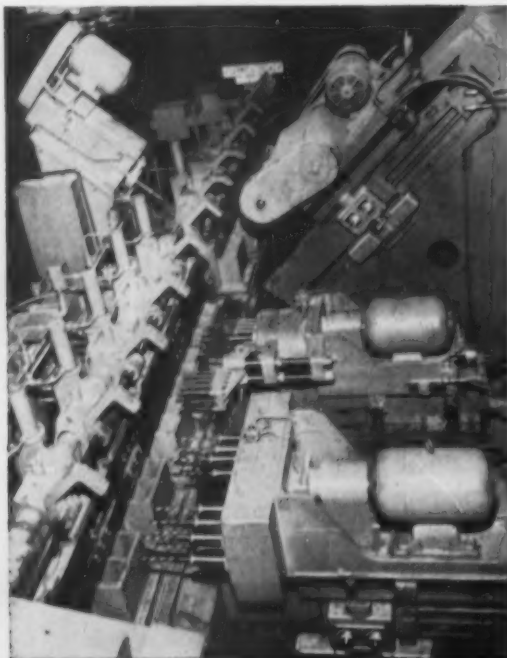
B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick
B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars
OTHER B&W PRODUCTS: Stationary & Marine Boilers and Component Equipment
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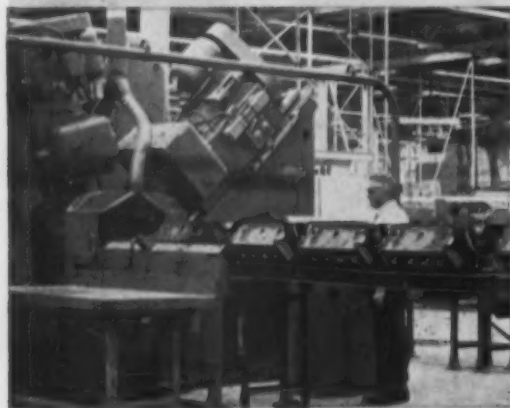
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VICKERS[®] HYDRAULICS Helps Cut Costs at PACKARD . . . on Wide Variety of Jobs in New V-8 Engine Plant



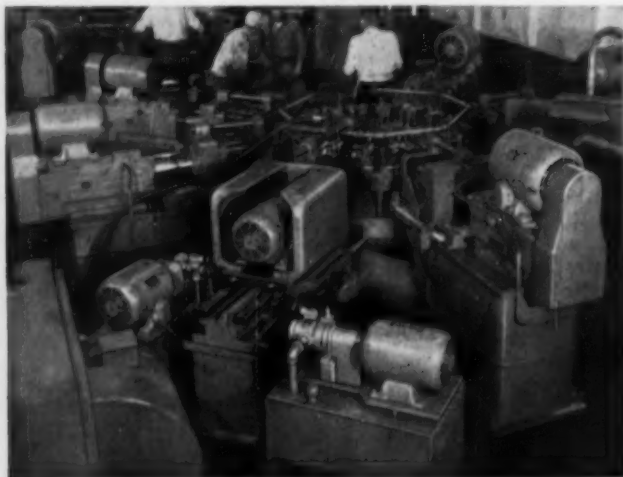
Kearney & Trecker machine for drilling and counterboring bearing caps. Note Vickers Traverse and Feed Cycle Control Panels visible on two heads; advantages include smooth and constant feed rates, easy adjustability, compactness and simplified installation.



Three Greenlee Transfer Machines in automated cylinder block line use Vickers Hydraulics. Compact Vickers Traverse and Feed Cycle Control Panel shown on head assures smooth and constant feed rate regardless of fluctuations in tool resistance or changes in hydraulic pressure or volume.

Representative of the many and varied production machines equipped with Vickers Hydraulics in the new Packard V-8 Engine Plant at Utica, Michigan are those shown here. Among the advantages of Vickers Hydraulics are: (1) simplification of design, (2) adaptable to automation, (3) ease of providing interlocks and overload protection, (4) ease of maintenance with minimum down time. Equally important, Vickers Hydraulics gives you the benefits of a nation-wide and full-time field engineering and service organization.

The Vickers Application Engineer near you will be glad to show you the benefits you can obtain by using Vickers Hydraulics. Write for a copy of Bulletin 5002.



Michigan Drill Head Co. 8 station dial machine for connecting rods and caps. Vickers Hydraulic Power Units shown are complete hydraulic "packages" (pump, electric motor, valves, oil reservoir, filter, etc.) that simplify design, and save installation and maintenance costs.



Udyite Automatic Processing Machine saves space and assures more uniform quality by using Vickers Hydraulics to raise, lower and transfer cam shafts through cleaning, coating and rinsing baths in "Lubrling" process.

VICKERS Incorporated

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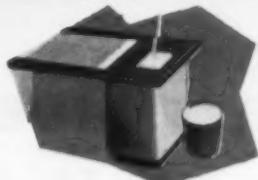
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a new vinyl-to-metal
laminating process that
gives sheet metal products
all these advantages...

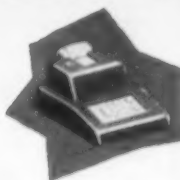
- lasting protection against rust and corrosion
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- uniform coverage of almost any thickness
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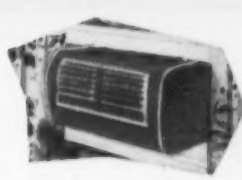
vending machine housings



waste baskets



business machine housings



air conditioner cabinets

Window moldings and dashboards of Marvibonded laminates could be permanently clad with vinyl material to match door upholstery and seat trim. And practically any choice of texture is possible—from glare-free matte finishes to rich leather-like grains.

There'd be no checking or flaking, no worries about scratched paint—no need for waxing or other care. The tough, chemical-resistant vinyl cleans with a wipe.

What's more, the vinyl surface would always be warm and pleasant to the touch. Marvibonding ends problems of

rust from moisture condensation. And it helps to deaden sound, as well as insulate against squeaks from metal to metal contact.

Why not Marvibonded panels and trim! Plenty of excellent reasons *why*. Excellent reasons why for hundreds of similar applications—like radio and television housings, business machine covers, vending machines, air conditioners, waste baskets, and many many more.

Better see what Marvibond can mean to your product! Write the address below today.

*Pat. applied for



Naugatuck Chemical

Division of United States Rubber Company
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Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latexes • Cable Address: Rubexport, N. Y.

April 7, 1955

33



1. Steel Sheet, smeared with die lubricant, is fed into the jaws of a powerful press that will deep draw it to the contour of a refrigerator door.



2. Smooth Finish is provided by grinding and polishing the door panel until the steel surface is bright and flawless.

Where Steel Goes Home-Hunting

Have you ever watched a woman select a refrigerator? She'll stand off and admire it, consider its capacity and color, check the conveniences it offers, examine its finish and compare it with others for styling and price. She wants the best looking, handiest, and most solidly constructed model she can fit into her kitchen and budget.

To give her what she wants takes better than ordinary steel. In today's competition, appliance manufacturers are insisting more than ever before on higher quality cold rolled steel sheets to meet high-speed production line requirements for producing the best looking appliances at lowest cost.

Many sheet steel users are specifying sheet steel from Pittsburgh Steel Company, where new equipment and the latest developments in electronic control are coupled with a half-century of know-how to produce exactly what is needed to meet these high-speed production line requirements.

• **What It Takes**—If you wonder why the quality of steel is so important, consider the appliance maker's problems for a moment.

The door panel for a refrigerator, for example, arrives at his plant as steel sheet. Fed into an 800-ton two-stroke ram press on one of his press lines, the sheet is deep drawn. Actu-



3. Steel Cabinets to encase the refrigerator are assembled and finished with careful precision for show-room appeal.



4. Glistening Coats of durable finishes in many colors are applied to the steel so that it will blend in with the dream kitchen.

ally the steel flows under tremendous pressure to make the strong, smoothly contoured door panel.

Each sheet must flow evenly to provide a complete door that has no surface imperfections such as grainy areas, seams, buckles, wrinkles, stretcher strains, or skin breaks and as this press can make eight door panels a minute, the steel must be absolutely uniform from sheet to sheet.

To provide uniformity, the steel's chemical composition cannot vary more than a few hundredths of one per cent. It must be clean and its grain structure must be controlled with microscopic accuracy. The finished cold rolled sheet cannot vary more than a few thousandths of an inch in thickness and must meet other close dimensional tolerances.

Whether it's a door panel, an outer cabinet, a compressor shell, or any

of more than a dozen special steel parts in a refrigerator, the story is always the same. The steel must have special inherent qualities to meet specific production line requirements and then go home-hunting.

• **How It Pays**—From modernized blast furnaces through to the newest sheet mills in the industry at Pittsburgh Steel, the making of steel is geared to meet the manufacturers' precise needs with the best that long experience and modern technology can produce.

If you use hot or cold rolled sheet steel in your operations, why not take advantage of the opportunities Pittsburgh can offer you in increased yield, longer die life, faster production, and better quality products. A phone call today to the office nearest you will bring prompt personal service.

Steel gets a two-way stretch



In forming the compressor shell for a refrigerator, disks of steel, $13\frac{3}{8}$ inches in diameter, are blanked from hot rolled drawing quality sheet (right). The blank feeds into a 200-ton double acting press (in background) where the first stroke draws it into a cup $3\frac{1}{2}$ inches deep. The next stroke turns the cup inside out, drawing it to a finished depth of $6\frac{1}{2}$ inches with a diameter of $6\frac{7}{8}$ inches.



After forming, the shell is trimmed, pierced and has fittings brazed into it. All parts must fit snugly, containing pressure without gaskets, to provide the heart-beat of the refrigerator as refrigerant is circulated. This ultra-modern, automatic equipment can produce up to 7,000 compressor shells daily.

"Everything New But The Name"

Pittsburgh Steel Company

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Write for your copy of the color brochure "The New Pittsburgh Steel Company."

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You'll not only see the latest in machine tools, you'll see the latest in machine tool accessories as well—two shows for the price of one: the Machine Tool Show, at the International Amphitheatre, and the Production Engineering Show, on the Navy Pier. Your Machine Tool Show badge will admit you to both.

Bring your key buyers of metalworking equipment with you; share with them this unequalled opportunity to see comparative demonstrations of the latest in cost-cutting methods—at the 1955 Machine Tool Show, your guide to greater values.

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* ESTIMATED ATTENDANCE,
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You get these 8 points of SUPERIORITY with Permanente Periclase D-S Brick



Permanente PERICLASE Brick for the Steel Industry:

Periclase "D-S" burned brick for open hearth and electric furnace bottoms. Low in iron, lime and silica. Chrome free. Maximum MgO in bottom.

Periclase-Chrome "A," plain and metal-encased for open hearth end walls, front walls and uptakes. Metal-encased for electric furnace sidewalls. High in MgO. Outstanding all-purpose refractory.

Chrome-Periclase "A," plain and metal-encased for open hearth back walls, front walls.

1. High MgO
2. Chromite-free
3. Low iron-oxide
4. Low calcium oxide
5. Maximum density; low permeability
6. Slag resistance
7. Great volume stability
8. Clean edges; accurate dimensions

All of these eight properties—outlined by major steel company ceramists as most desirable for sub-hearth brick—are found in Permanente Periclase D-S Brick.

This superior brick has been *designed especially* to withstand sub-hearth conditions—thus gives maximum protection against costly breakthroughs, gives longer sub-hearth life.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately-sized Periclase grains derived from sea-water magnesia. Absence of chromite eliminates the reduction of chromium oxide when the sub-hearth may be in contact with the bath or when carbon monoxide penetrates to the sub-hearth.

Low iron oxide minimizes refractory damage through alternate oxidation and reduction of iron oxide and other iron compounds. Low calcium prevents damage caused by slaking during slow heat-ups or while furnace is idle.

With all its many advantages, Permanente Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

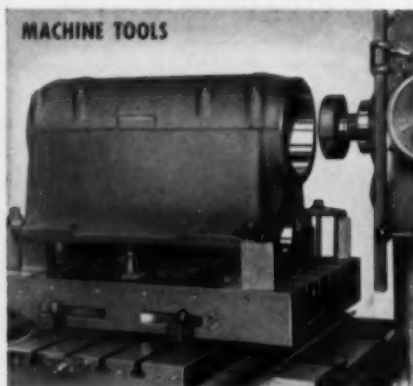
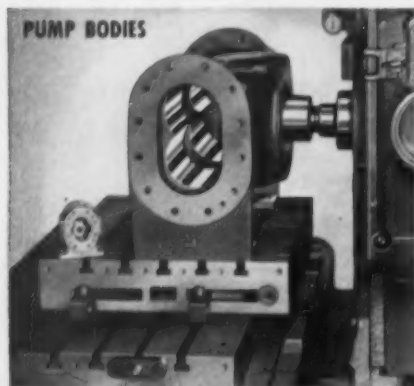
Call or write Kaiser Chemicals Division, Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway, OAKLAND 12, California . . . First National Tower, AKRON 8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana (CHICAGO).

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***JIGLESS PRODUCTION**
... eliminates expensive boring jigs!



TYPICAL EXAMPLES OF JIGLESS PRODUCTION ON DE Vlieg JIGMILS



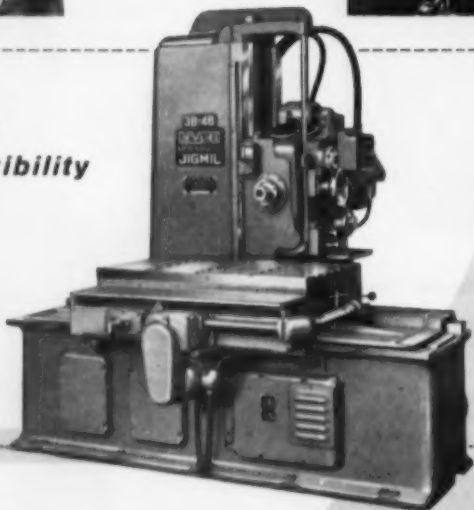
The
JIGMIL Technique:

- ELIMINATES SPECIAL BORING JIGS
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- PERMITS USE OF SIMPLIFIED TOOLING
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If your shop is burdened with costly boring jigs and special tooling, it will pay you to investigate the **DeVlieg SPIRAMATIC JIGMIL**



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Save furnace time with... "ELECTROMET" SILICOMANGANESE

TRADE-MARK

ELECTROMET silicomanganese is an excellent deoxidizer for cleansing steel quickly and thoroughly. This combination alloy contains two active ingredients in the correct proportion for rapid deoxidation of the furnace bath. Because of the low carbon content of the alloy, the carbon in the bath need not be reduced so much as would otherwise be necessary.


This combination of rapid deoxidation and low carbon content can save as much as 20 minutes per melt in the production of open hearth steels. Furthermore, it provides close control of final analysis when blocking the heat. ELECTROMET silicomanganese is also well suited for additions

to the ladle to adjust final specifications, particularly for engineering steels.

ELECTROMET silicomanganese contains 65 to 68 per cent manganese, and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades (containing 18 to 20 per cent, 15 to 17.50 per cent, and 12 to 14.50 per cent silicon, respectively). ELECTROMET's metallurgists, with years of practical experience in steel making, will be glad to help you with the use of silicomanganese, or any ELECTROMET products. Write or phone the nearest ELECTROMET office for further information or ask to have one of our metallurgists call. There is no cost or obligation for this service.

The term "Electromet" is a registered trade-mark of Union Carbide and Carbon Corporation.

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Versatile Republic Materials Handling Equipment helps solve this problem by providing greater storage capacity in less area. It also eliminates cluttered aisles and traffic hazards. Permits the most efficient movement and han-

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dling of materials at every stage of production.

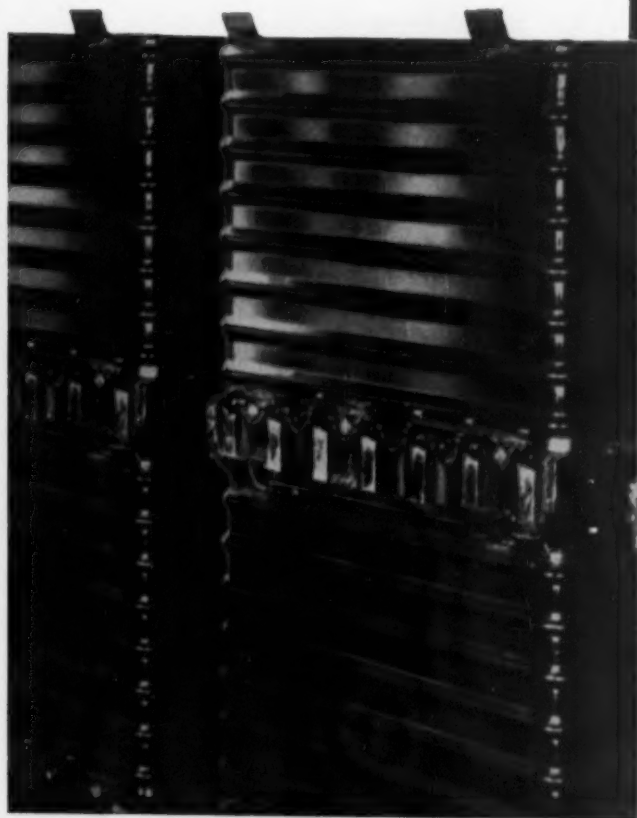
Take the PB-120-T Box and Skid Unit, illustrated below. It's equipped with tiering lugs which permit tiering to any practical height, thereby conserving additional space. Units are easily picked up and rapidly moved to any point on the production line.

Maintenance costs are reduced, too. Construction features of all Republic Materials Handling Equipment assure you long, efficient service at lowest per-year cost.

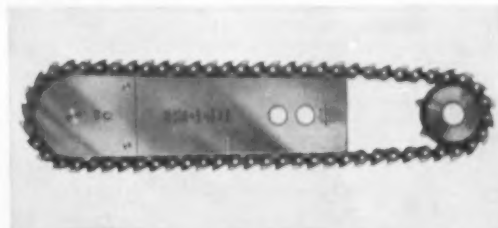
Republic Materials Handling Equipment can be adapted to the needs of any industry. A Republic engineer will be happy to talk over your handling problems. Or work with you in designing special equipment to fit into your particular operation. Send the coupon for all the facts.

STEEL

Steels and Steel Products



THIS MAIN FRAME BEARING MEMBER for a diesel locomotive was made from Republic C-1020 forging stock. Countless forging and general manufacturing companies look to Republic as a dependable source for hot rolled steel bars. Rounds, squares, hexagons, octagons and flats are produced in all grades of carbon, alloy and stainless steels. Republic also supplies hot rolled special sections for economical mass production of steel parts where the section conforms to the predominating cross section of the part.



ALLOY STEEL INCREASES TOOTH LIFE ON CHAIN SAW. Speeds up to 2000 feet per minute are tough on teeth of this chain-saw mortise chain. Ordinary steel teeth snap off. Republic metallurgists recommended a standard alloy, not too high in chrome, to the manufacturer, W. H. Field Co., Boston, Mass. Cutter life was increased; heat treating methods improved; form milling eliminated by buying a special shape.



LIFTING AND MOVING HEAVY MATERIALS like steel bars, sheets and machinery is safe and easy with Republic Chain Slings. Many types and sizes are made by Republic. All are proof tested and warranted for the highest degree of safety. Republic also produces a complete line of welded and weldless chain for every industrial use. A Republic Chain Engineer will be happy to show you how any one of these chain products can be put to work profitably in your plant.

You Can't Read This Ad Without Visualizing Tremendous Savings in Your Plant

If the handling of bulk materials is required in your plant, be they raw, finished, moist, liquid or rubbish materials, read these simple facts about the Dempster-Dumpster System. Then, visualize its application and tremendous savings possibilities in your own operation.

VISUALIZE HAVING ONLY ONE TRUCK with scores of bodies. One truck-mounted Dempster-Dumpster with only one man, the driver, serving many detachable Dempster-Dumpster Containers. These containers range from 2 to 21 cu. yds. capacity for use with recommended type Dempster-Dumpsters, and each container built to suit the materials to be handled—be they solids, liquids, dust, bulky, light or heavy. You place a container at convenient materials accumulation points, in or out of plant. As each is loaded, it is picked up, hauled and dumped, or the load is set down intact, and the entire operation is handled by hydraulic controls in cab by only one man, the driver.



THE NATION'S LEADING FIRMS USE THIS SYSTEM BECAUSE OF ITS AMAZING EFFICIENCY AND TREMENDOUS SAVINGS.



The photographs above were made in the plant of one of the nation's leading brands of soaps and dentifrices. This installation comprises a single Dempster-Dumpster and 49 containers. Photos illustrate the simple one man pick up, hauling and dumping operation of a drop bottom container.

YOU ELIMINATE trucks standing idle . . . eliminate re-handling of materials . . . eliminate loading crews. You increase efficiency, sanitation and good plant-keeping with this amazing Dempster-Dumpster System—the lowest cost method of bulk materials handling ever devised. Write us now for complete information. Manufactured and sold exclusively by Dempster Brothers, Inc.

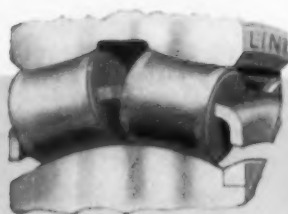


One Truck Mounted Dempster-Dumpster Handles Scores of Containers... All Designs... All Sizes.

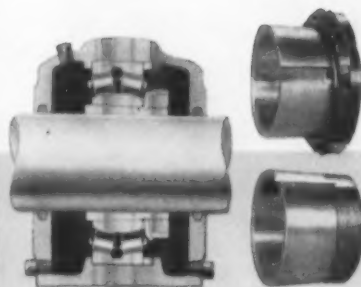
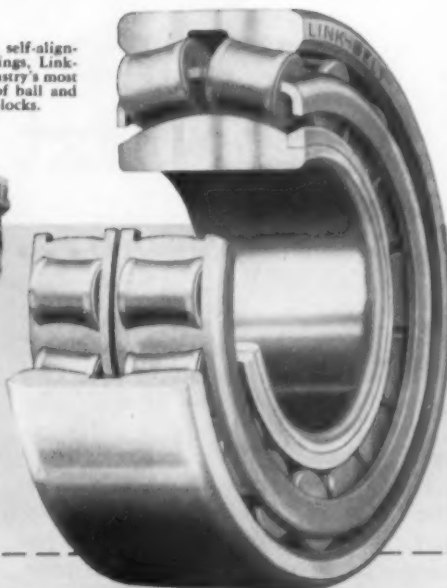
DEMPSTER BROTHERS, 445 N. Knox, Knoxville 17, Tennessee

For tough, heavy-duty applications...make use of these important bearing differences

In addition to self-aligning roller bearings, Link-Belt makes industry's most complete line of ball and roller bearing blocks.



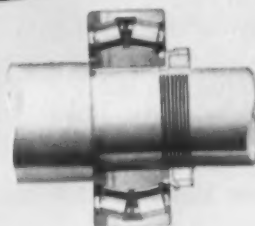
FREE ROLLING—SELF-ALIGNING. Rollers are naturally positioned by their concave shape. Design assures true rolling under all conditions. Spherical inner ring can be aligned in any direction without affecting load capacity.



EASY INSTALLATION and removal of adapter type bearings are provided by the tapered fit of bearing on adapter sleeve which is readily adaptable to commercial shafting tolerances. Locknut draws sleeve tightly around shaft for positive, concentric mounting. Lockwasher holds locknut in place.

LOCKED-IN CLEARANCE. Selective assembly of rollers and raceways with accurately formed hardened steel retainers assures proper operating clearance, guidance and spacing of rollers.

Rollers are completely pocketed in retainers for accurate spacing and guiding.



SMOOTH OPERATION, LONG LIFE are advantages of the straight bore type mounting, which assures maximum concentricity of inner ring with shaft. Especially desirable when minimum radial run-out is essential.

*They're all present only in
LINK-BELT self-aligning roller bearings*

SUBTLE differences in bearings can make notable differences in the life and efficiency of your equipment. Take Link-Belt self-aligning roller bearings, for example. Their "self-contained" feature permits the bearing to float axially in the mounting, when desired, compensating for shaft expansion or settling of bearing supports . . . preventing extraneous thrust loads from being set up between bearings on the same shaft. What's more, inherent self-aligning design and preadjustment preclude use of expensive or cumbersome self-aligning housings.

Ask your nearest Link-Belt office or authorized stock-carrying distributor for Book 2196 on self-aligning roller bearings and Book 2550, containing full data on all Link-Belt ball and roller bearings.

LINK-BELT

Ball and Roller Bearings

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 12,711-A



The issue of *The Iron Age* you'll save for the next 100 years...

... because The Iron Age's "100 Years of Metalworking" will be the most comprehensive issue of a magazine ever published on metalworking.

In this 100th year commemorative issue you'll find a review of the past, a discussion of the present and—most important—a prediction of the future of every phase of the giant metalworking industry. The list on this page gives you just the bare skeleton of this giant editorial enterprise.

"100 Years of Metalworking" will be a treasured collector's item. And it will serve as a planning guide for future industry expansion and future technological development. The publication date is Mid-June. You'll receive it as part of your regular subscription to The Iron Age.

Watch for "100 Years of Metalworking" — Mid-June, 1955

WANTED

The earliest issues of The Iron Age
—first published in 1855
—still in existence in this country.

\$500.00 reward will be paid for the issue you discover and submit with the oldest dateline (send photostats or facsimiles—actual issues only if you are a contender). The issue shown at right is one of the earliest copies still on file in The Iron Age's office. Older copies may have similar characteristics.

For complete details of this reward write for set of rules governing entries.

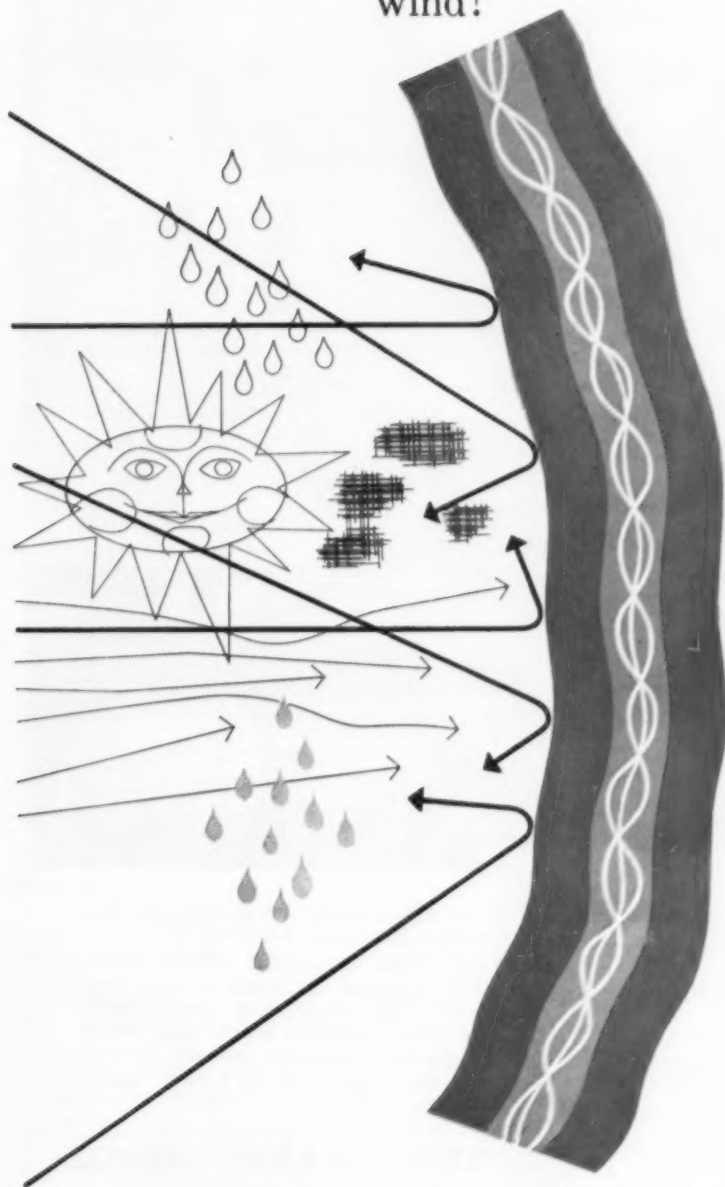


The Iron Age A Chilton Publication

Old Issue Information • 100 East 42nd Street, New York 17

- Iron Age History
- Atomic Energy
- Casting
- Heat Treating
- Iron and Steel
- Machine Tools
- Materials Handling
- Metal Finishing
- Nonferrous Metals
- Press Work
- Refractories and Ceramics
- Testing, Inspection and Instrumentation
- Welding, Brazing and Joining
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this
wrap-around
shield
keeps out
more than
wind!



This is a cross section of a new paper developed by Cromwell as a wrap for sheet steel shipped by barge. Only Cromwell could "build-in" this wide range of protective abilities in a single sheet...

**EXTRA-WATERPROOF
OIL RESISTANT
EXTRA-STRONG
SCRATCHPROOF
FLEXIBLE
VOLATILE
CORROSION INHIBITION**

This new Cromwell sheet consists of two heavyweight sheets of kraft, blond laminated for high waterproofness, oil resistance and moistureproofness. It is reinforced with just enough specially selected glass fibers to provide strength and prevent a tear, but not enough to injure flexibility. The entire structure is embossed for flexibility. One wall of kraft is treated with Ferro-Pak VCI to prevent rust. Printed for brand or company identification.

A versatile paper like this may be just what you've been looking for. But whatever your needs, Cromwell "Paper Engineering" can give you the bag, cover or liner with the *right* combination of protective qualities. Write us about your problems.



See us in Booth 213 at the AMA Packaging Exposition in Chicago, April 18-21.

paper engineering *by*

CROMWELL

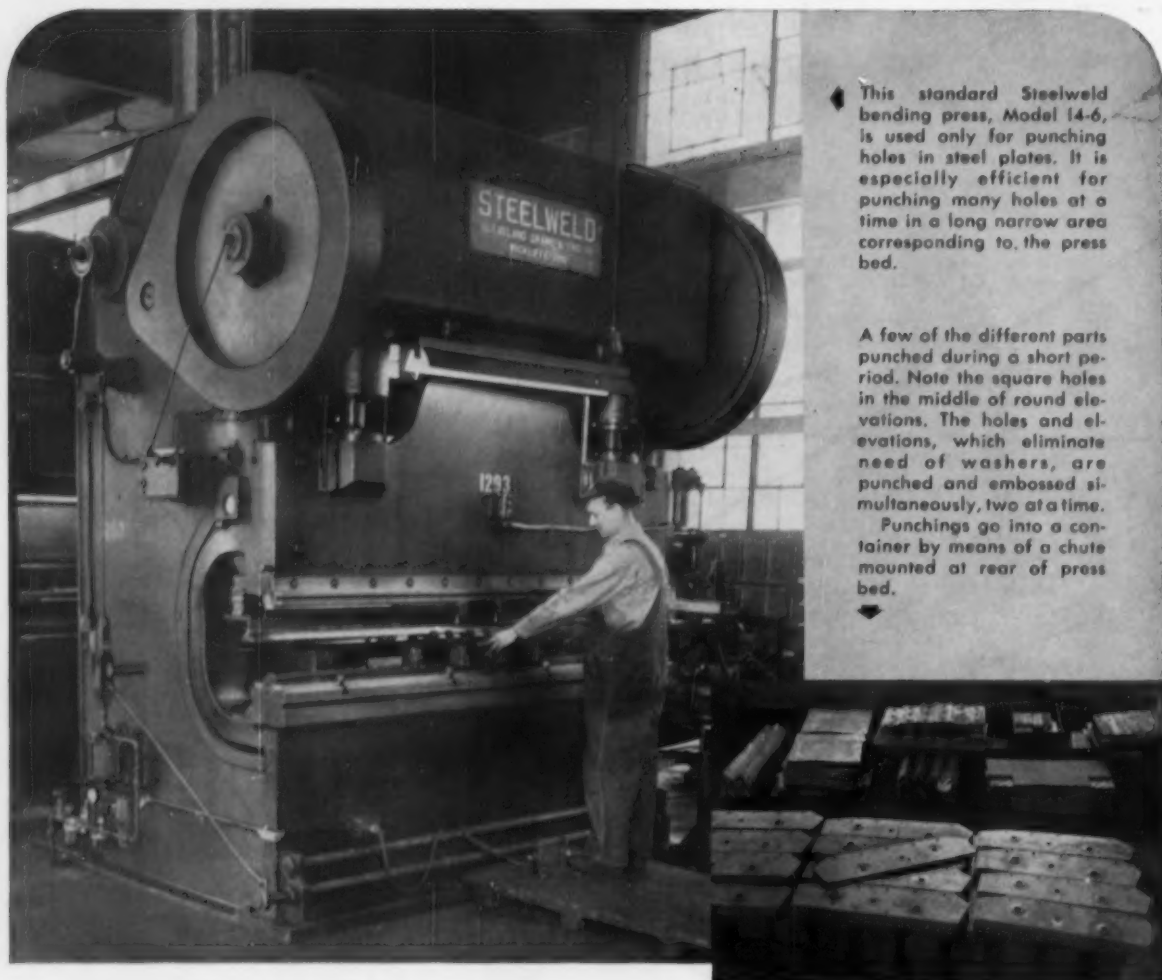


PAPER COMPANY • 4803 South Whipple Street • Chicago 32, Illinois

MANUFACTURERS OF: Papers (Impregnated • Coated • Laminated Reinforced • Flexible) Bags • Sacks • Liners • Covers • (Single and multiwall construction, using all types of material to carry, cover or protect all types of products.)

April 7, 1955

Press Brake Used Solely For Multiple Punching



This standard Steelweld bending press, Model 14-6, is used only for punching holes in steel plates. It is especially efficient for punching many holes at a time in a long narrow area corresponding to the press bed.

A few of the different parts punched during a short period. Note the square holes in the middle of round elevations. The holes and elevations, which eliminate need of washers, are punched and embossed simultaneously, two at a time.

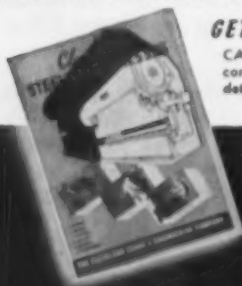
Punchings go into a container by means of a chute mounted at rear of press bed.

BENDING BRAKES are not always used for bending. Here is one that is used solely for multiple-punching work. It is on its 12th year of continuous operation, punching holes of various sizes and numbers.

While other Steelweld presses in the plant where this machine is located handle many bending and forming operations, any Steelweld can be quickly switched from one form of work to another and

thus take care of a wide variety of jobs: bending, forming, multiple-punching, blanking, etc.

Steelweld Bending Presses are versatile, heavily-built tools designed for quick set-up, easy operation and long trouble-free performance. Hundreds of these machines are serving every segment of the metal-working industry. If you need a press brake, you will be happy with a tried and proven Steelweld.



GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

4860 East 281st Street, Wickliffe Ohio

STEELWELD

BENDING PRESSES

BRACING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

"Bogey at 6,000 miles!"

Sure, six thousand miles is beyond the range of today's radar equipment. But radar has been so highly developed since the end of World War II that who's to say how long it'll be until we're thinking in terms of thousands of miles . . . or more?

We're proud of the part we play in producing the world's most sensitive radar sets. Granted, it's a small part—*many* small parts—but our team of precision engineers, tool-makers and machinists makes certain that *If We Ship It . . . It's Right!* We work with practically every major builder of radar equipment—supplying the mounts on which the scanners turn, twist and probe. We're confident, too, that in the future, we'll continue to furnish component parts that will enable us to spot bogeys 'way out there—yes, even 6,000 miles away! For a book on our company—its facilities, its people and accomplishments—just write to: The Steel Products Engineering Company, Springfield, Ohio, and ask for our new Plant Brochure.



**THE STEEL PRODUCTS
ENGINEERING COMPANY**

TIMKEN® TQIT bearings speed roll removal at Detroit Steel's new Portsmouth mill

INSTALLED on this 31 x 56 2-hi skin pass mill at Detroit Steel's Portsmouth plant, are the new Timken® 4-row tapered bore, tapered roller bearings. They have interference fit. Yet they save considerable time on roll changes. By expanding their cones hydraulically, you can remove these Timken TQIT bearings from the roll neck quickly and easily.

The interference fit cones provide greater stability between the cone

and neck, plus better load distribution. Excessive scuffing and neck wear are eliminated on high-speed mills like this one. And Timken TQIT bearings cut neck stress and deflections because they permit improved fillet contours and larger necks.

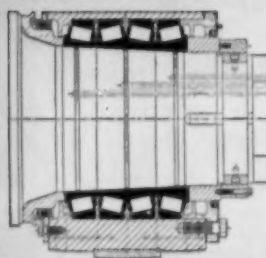
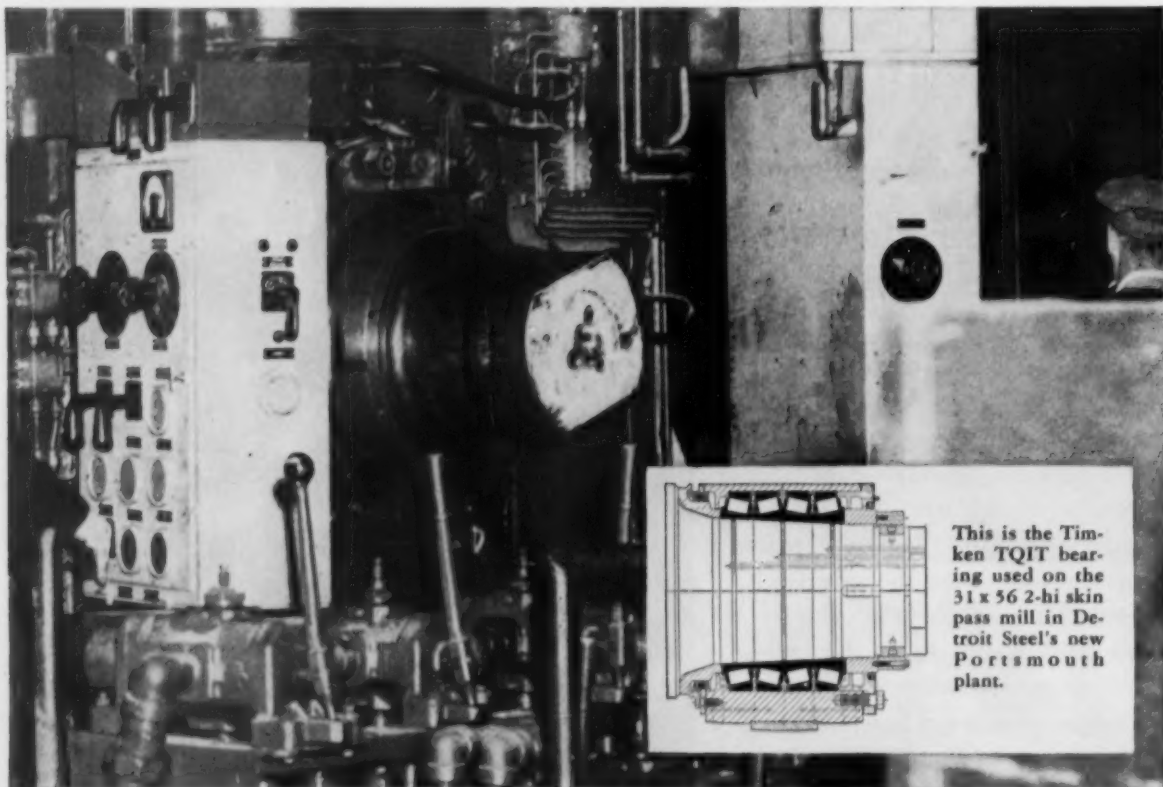
Like other Timken roll neck bearings, Timken TQIT bearings permit maximum roll neck size and greater mill rigidity. They also eliminate the need for special thrust bearings, make possible higher mill

speeds. In addition, they allow starting and stopping of this skin pass mill without loss of steel.

To get these advantages in the equipment you build or buy, always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



This is the Timken TQIT bearing used on the 31 x 56 2-hi skin pass mill in Detroit Steel's new Portsmouth plant.

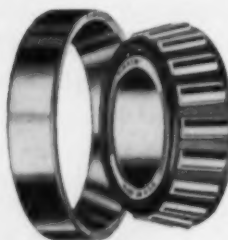


ROLL NECK BEARING ENGINEERING SERVICE

Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. nickel-rich Timken alloy steels.

TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

HEAVYWEIGHT SHEDS 280 POUNDS!

ANOTHER WESTINGHOUSE "FIRST"— NEW CONTROL CENTER STRUCTURE MADE OF REYNOLDS ALUMINUM

Always a pioneer in developing the latest in electrical apparatus, Westinghouse again leads the way with this all-aluminum control center structure. Using Reynolds Aluminum, Westinghouse reduced the enclosure weight from 430 pounds to slightly over 150 pounds.

Aluminum is used throughout—from outer cabinet, sub-base and screen baffles to vertical and horizontal aluminum bus bars.

Aluminum offers a more attractive, clean-cut appearance—important in applications where cleanliness and neatness are necessary. Aluminum offers the corrosive resistant qualities so necessary in chemical plants. In the words of Westinghouse “—aluminum opens new fields of greater performance in control center applications.”

This significant advance in the application of aluminum is another reason why...

“You Can Be Sure...If It's Westinghouse.”



Reynolds Aluminum
Engineering and
Styling Services

The specialists in Reynolds Engineering and Styling Departments know aluminum. They know design... they know engineering... they know fabrication. But most important, they know aluminum.

These men are working with many manufacturers, collaborating with designers and independent consultants on a mutually beneficial basis. This service is available without obligation through the Reynolds office or distributor listed under “Aluminum” in your classified phone directory. Or write Reynolds Metals Company, 2526 South Third Street, Louisville 1, Ky.



See “Mr Peepers”, starring Wally Cox, Sunday nights on NBC-TV

REYNOLDS



ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

MORE

Knowing How

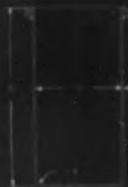
...often means Savings and a Better Product



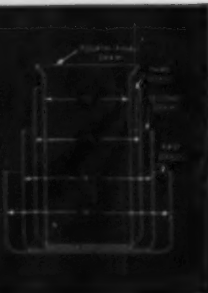
...this handbook
**"ALUMINUM
FORMING"**
gives complete information
on aluminum techniques

Everyone who works with aluminum should have this 148 page handbook from the Reynolds library of technical handbooks. "Aluminum Forming" was published so that product designers and plant supervisors could have, in a single volume, complete information on the proper techniques for bending, forming and drawing aluminum. Design and fabricating practices with aluminum are not always exactly like those for other metals. In some cases modifications or even special procedures may be required. This handbook fully explains all these procedures and includes more than two hundred and thirty drawings and photographs, twenty-two tables and thirty-two formulas.

Single copies of the valuable Forming handbook are free when requested on business letterhead (otherwise the price is \$1.00). A complete index of Reynolds technical literature is also available. *Reynolds Metals Company, 2526 So. Third Street, Louisville 1, Ky.*



These are typical of the many illustrations in "Aluminum Forming": Left, drawn shell of 3003-O aluminum. Right, various stages of drawing necessary to produce shell. (Book includes formula for estimating number of draws.)



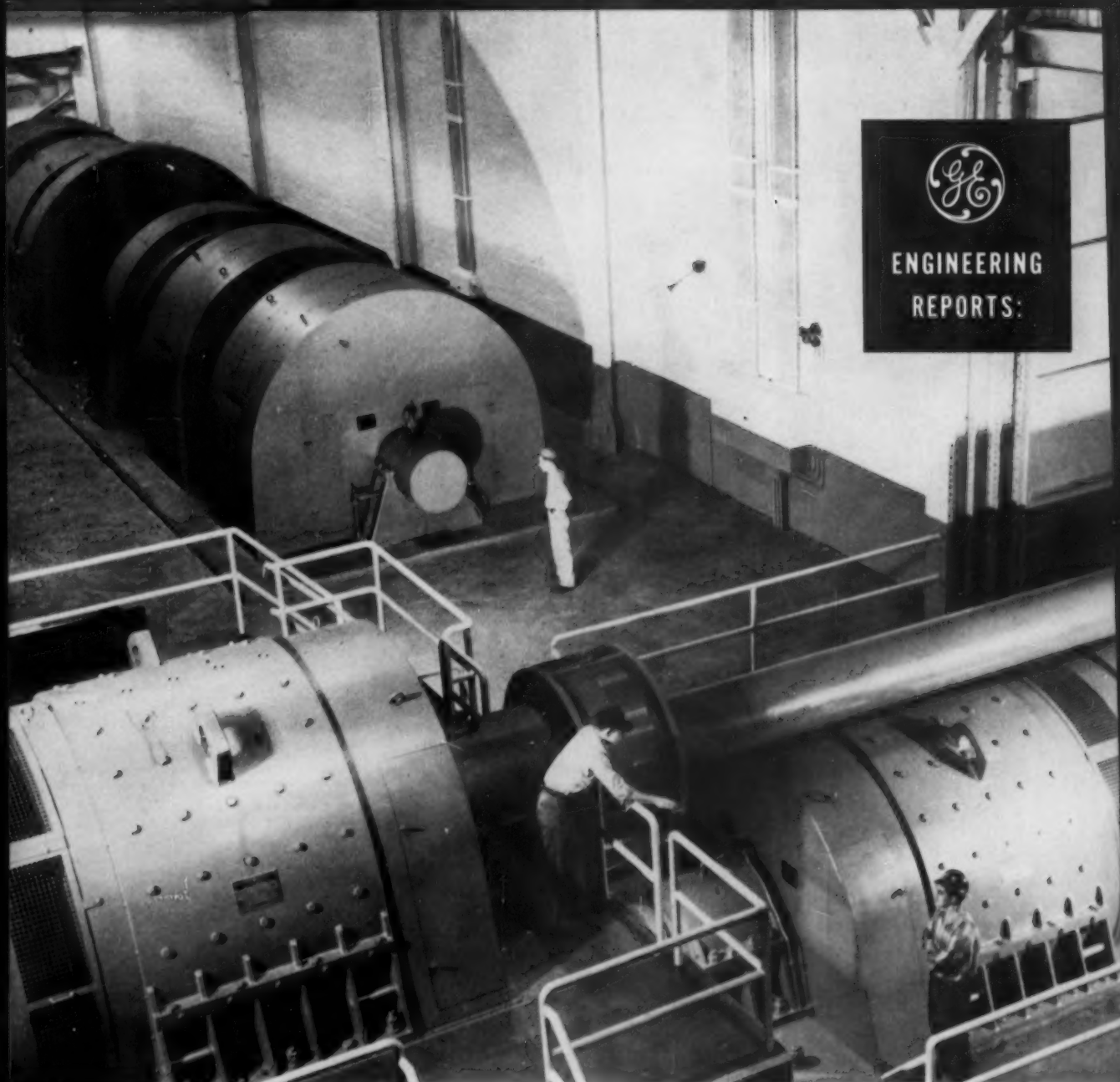
See "Mister Peepers", starring Wally Cox, Sunday nights on NBC-TV

REYNOLDS



ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND



ENGINEERING
REPORTS:

AT JONES AND LAUGHLIN'S ALIQUIPPA, PA. MILL, FOUR GENERAL ELECTRIC 3000-HP MOTORS DRIVE . . .

Record-breaking reversing blooming mill

Jones and Laughlin's 44 in. blooming mill at Aliquippa, Pa., has smashed all previous world production records for small ingots. Powered by a coordinated General Electric drive system, this mill which is reversed from 70 rpm to 70 rpm in one second, has rolled 576 ingots in one eight hour shift—a 10 per cent increase over the old record set by the same mill when it was steam-driven.

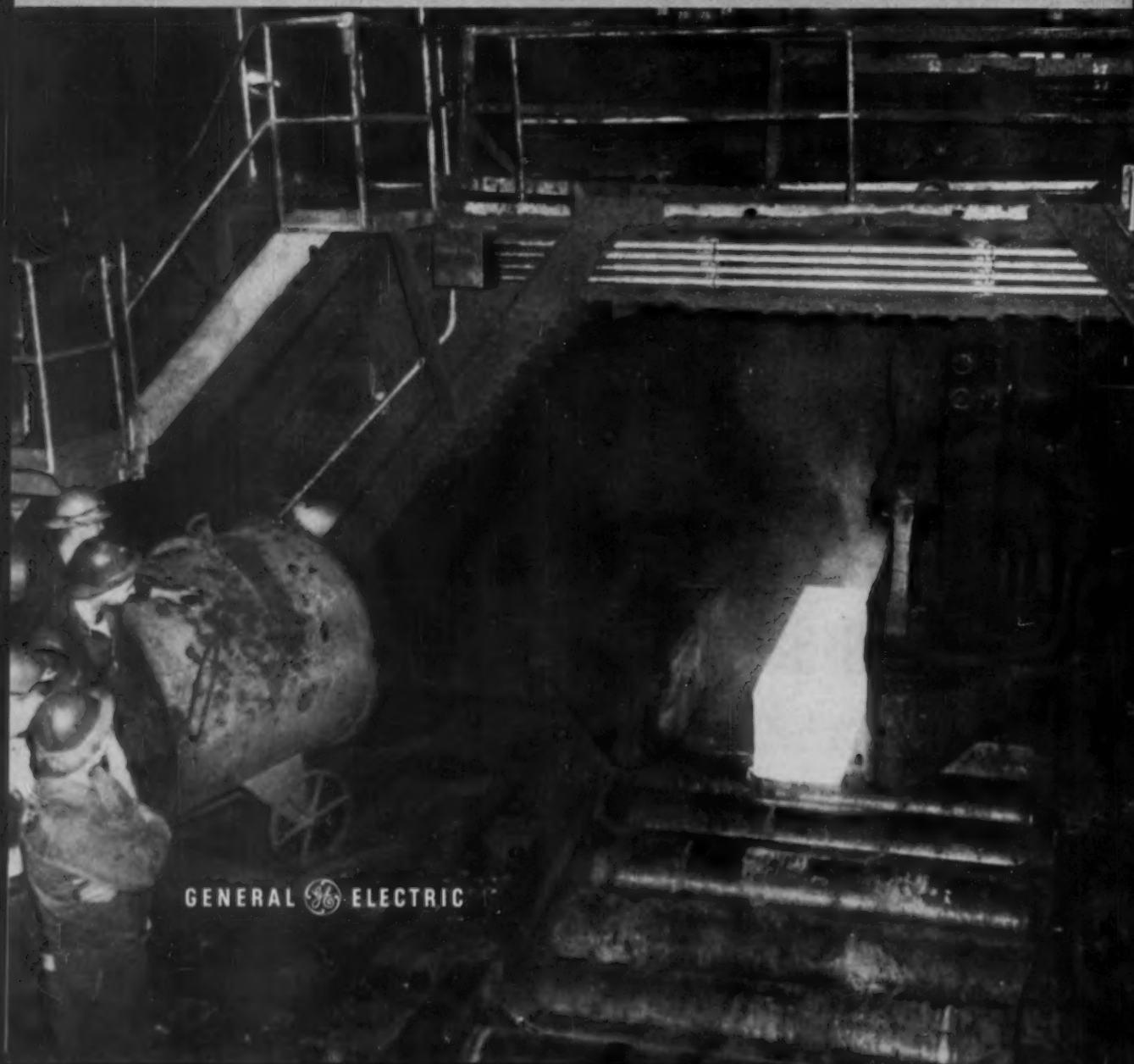
J&L's conversion from steam to electric drive was an outstanding feat. In only 7 days, 14¼ hours the mill was back in full, around-the-clock production. This was more than two days ahead of the schedule set up for the changeover. For the story of the conversion and how G-E engineering services aided J&L in this operation see the following pages.

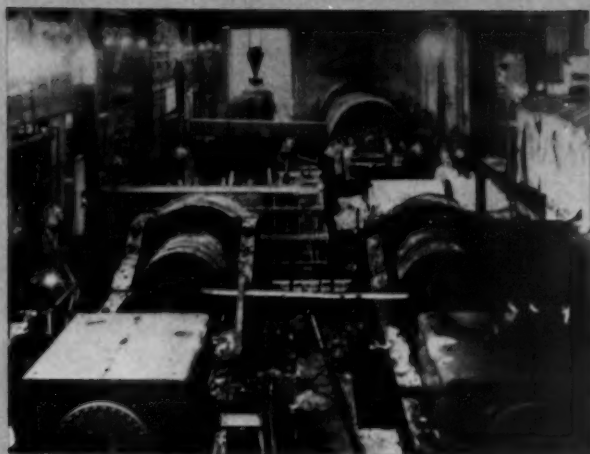
SEE CONVERSION STORY ►

GENERAL  ELECTRIC



GENERAL ELECTRIC engineers pre-determined electric drive system adjustments with electronic differential analyzer, and built wooden scale model of drive to rehearse conversion.





JONES & LAUGHLIN engineers directed entire conversion, working day and night. Approximately 200 workmen per turn were utilized in the change-over which saw . . .

FULL PRODUCTION RESTORED IN 7 DAYS, 14½ HOURS

To help assure that Jones and Laughlin's conversion from steam to electric drive would be completed within 10 days, and that the new drive would help J&L surpass old production records, General Electric utilized its full range of engineering services.

Working closely with J&L, G-E analytical engineers simulated all operating conditions on an electronic differential analyzer. With G-E product engineers assisting, the design and adjustment of the electrical system were determined after "runs" of the mill on the analyzer were examined. As a result of these computer studies, the drive system was "tailored" to meet the exact requirements of Jones & Laughlin.

To help speed the conversion, a wooden scale model of the 12,000-hp main drive, its foundation and the steam engine foundation was

built to study the problems involved in the installation. The model was assembled and disassembled piece by piece as J&L and G-E engineers rehearsed the actual changeover.

More time was saved when the electrical system was designed so that switchgear, m-g sets, exciter sets, control and even ventilating equipment could be installed and tested before the old drive was shut down. G-E field engineers were on hand to assist in the conversion and start-up of the drive.

These G-E engineering services are available to you. They will help save you time and money whether you are planning to modernize, expand, or build. For further information about these engineering services, contact your nearest G-E Apparatus Sales Representative, or send for bulletin GEA-2244. General Electric Company, Schenectady 5, N. Y. 699106

Engineered Electric Systems for Steel Mills

GENERAL  ELECTRIC



DESIGNED TO MEET AISE STANDARDS, a new General Electric single-magnet, two-shoe, direct-current brake is shown installed

on a slab depiler at Jones & Laughlin Steel Corporation plant — Cleveland Division. All brake settings are made at one end.

New General Electric d-c brake with single-point adjustment cuts maintenance time at J&L

ONE OF THE FIRST General Electric direct-current brakes with single-point adjustment underwent tests at Jones & Laughlin Steel Corporation's Cleveland Division. On actual rigid application duty J&L found the brake needed a minimum of maintenance and reduced expensive down-time. New design features which won the approval of J&L maintenance personnel are as follows:

ONE EASY ADJUSTMENT with a wrench is all that is needed to correct for lining wear. Even where one lining wears more than the other, a self-centering fulcrum automatically equalizes both shoe clearances.

ARMATURE GAP INDICATOR shows when to make lining wear adjustment. Normal gap position is clearly shown on this readily accessible gage.

SET AND FORGET torque on the new G-E brake, no more adjustments are necessary. Should the brake's rating be changed, torque setting is easily varied to correspond.

BUILT TO AISE STANDARDS the new brake is suitable for both horizontal and vertical mounting under most

conditions. It can be right- or left-hand mounted with no change in pins or bolts.

MORE VERSATILE INSTALLATION is possible with the new brake because all necessary adjustments, settings, and connections can be made from one end. This allows the equipment to be mounted within tight space limitations—only one end need be accessible.

REMOVABLE LININGS can be slipped out with a screw driver after holding bolts are removed—no need to disassemble complete brake shoe.

UNIQUE STRONGBOX MAGNET COIL is easily removable independent of complete magnet assembly. Coil construction seals out dust, moisture, oil, and helps protect windings against mechanical damage.

REDUCE MAINTENANCE and down-time as J&L did—get G.E.'s new d-c brake. For more information contact your nearest General Electric Co. Apparatus Sales Office or send for Bulletin GEA-6214, Section 781-10, General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL  **ELECTRIC**

NEW

PRECISION WAY to hob gears up to 23 ft. diameter

SCHIESS RF GEAR HOBBERS

Tremendous! Yes—and newly designed! Cut mammoth gears from 9 ft. to 23 ft. diameter with "lightweight" precision! Spur, helical and herringbone gears (including internal gears). Also wormwheels of either low- or high-lead angle.

Accurately centered fixed table supports blanks ranging from 20 to 80 tons. Moving column adjustable for both diameter of gear and depth of tooth. Cuts in either upward or downward direction. Huge master wormwheels assure accuracy of indexing movement. Tooth pressures of worms offset each other—no lateral stress.

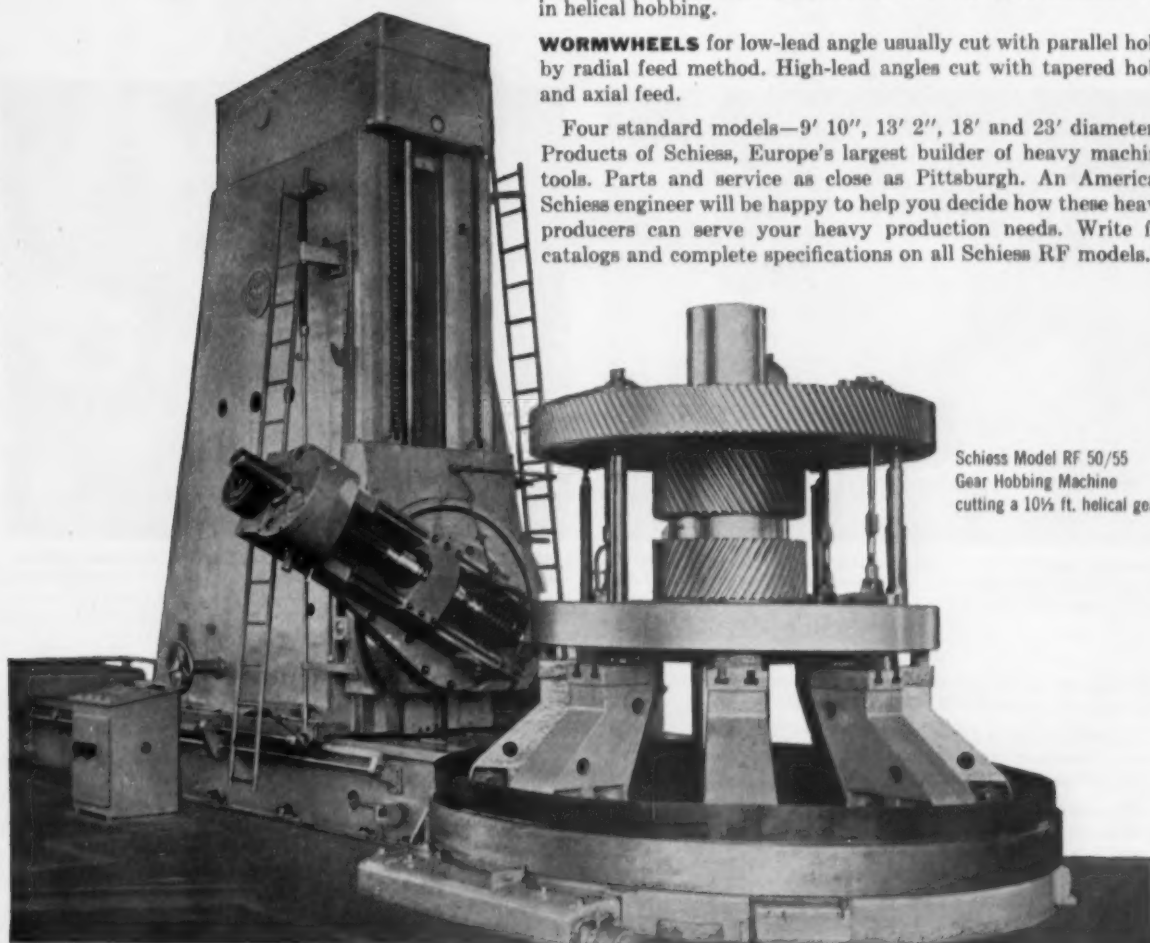
SPUR GEARS cut by driving work table through index change gears connecting with hob spindle drive.

SINGLE HELICALS (or double helicals with teeth separated by gap) produced by additional table movement—by means of differential gear provided with change gears.

HERRINGBONES cut with end mills by means of single indexing method. Additional table motion achieved by same method used in helical hobbing.

WORMWHEELS for low-lead angle usually cut with parallel hobs by radial feed method. High-lead angles cut with tapered hobs and axial feed.

Four standard models—9' 10", 13' 2", 18' and 23' diameters. Products of Schiess, Europe's largest builder of heavy machine tools. Parts and service as close as Pittsburgh. An American Schiess engineer will be happy to help you decide how these heavy producers can serve your heavy production needs. Write for catalogs and complete specifications on all Schiess RF models.



Schiess Model RF 50/55
Gear Hobbing Machine
cutting a 10½ ft. helical gear.

Engineering Division

AMERICAN

SCHIESS

CORPORATION

38th Street and AVRR, Pittsburgh, Pennsylvania

Sole Distributor



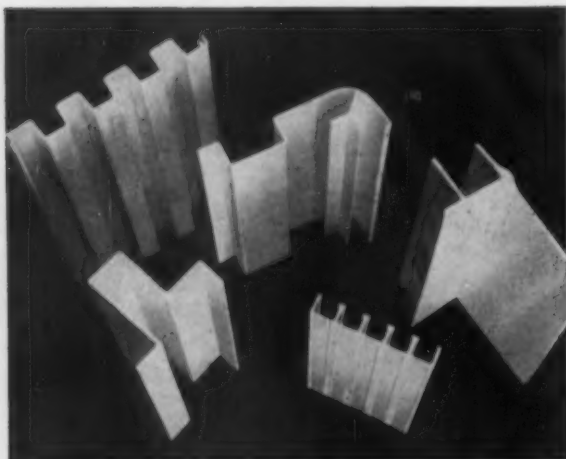
KURT ORBAN

COMPANY, INC.

34 Exchange Place, Jersey City, N. J.

Service to manufacturers

is our business



EXTRUDED SHAPES All standard alloys are available in custom shapes (solid, semi-hollow and hollow), structural, rod and bar, and in extruded tube.



SHEET AND PLATE Supplied as flat sheet, plate, coil sheet, circles in a complete range of alloys, sizes and tempers. Specialty sheets available on inquiry.

As a basic producer of aluminum, we are in the business of supplying manufacturers of end products.

Therefore, our efforts are put behind the job of serving these manufacturers—and helping them in the solution of their problems.

In recent years, our services have been expanded in order to keep pace with our greatly increased production capacity—which today is close to 30% of all the primary aluminum made in this country.

To give you fast personal service, we have expanded our sales offices to key cities throughout the country.

We have expanded our distributor program so that we

now have a warehouse distributor in almost every major city.

We have increased our sales force and our staff of field engineers, employing specialists in many fields, such as roll-forming, extrusions, conductor, etc.

However, important as these additions are, we believe the most significant thing about Kaiser Aluminum's service is the attitude behind it. An attitude that moves men to work harder, longer, and with greater determination.

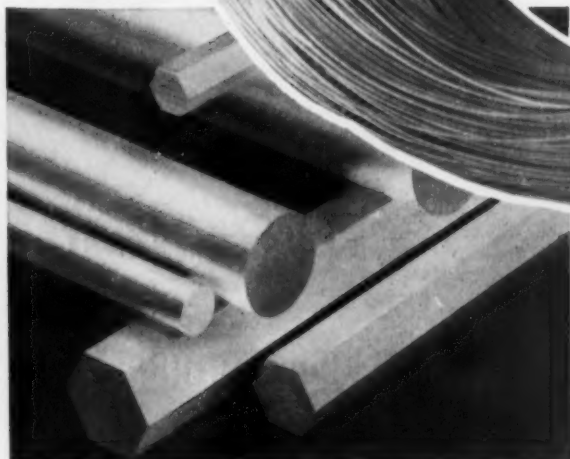
We believe that the kind of service we offer—combined with the unsurpassed quality of Kaiser Aluminum—should be of particular interest to all aluminum fabricators.

Setting the pace... in growth, quality and service

Kaiser



WIRE Supplied as round or hexagonal drawn wire. Also rivet, welding, screening, EC and redraw.



ROD AND BAR Available in a wide range of alloys in rolled and cold finished rod and bar, round and hexagonal standard screw machine stock, hexagonal bar, redraw rod, rivet rod and round forging stock, square and rectangular bar.



PIG, INGOT AND BILLETS Kaiser Aluminum produces Pig, Ingot and Extrusion Billets in a range of alloys and sizes to meet your specific requirements.

For complete information, call or write any Kaiser Aluminum sales office or one of our many distributors, located in principal cities. See our catalog in Sweet's Product Design File or write for copy. Kaiser Aluminum & Chemical Sales, Inc., General Sales Office, Palmolive Bldg., Chicago 11, Illinois. Executive Office, Kaiser Bldg., Oakland 12, California.

Other Kaiser Aluminum products include: industrial foil, and electrical conductor. Kaiser Aluminum also supplies household, freezer and broiler foil for home uses; Shade Screening for the building industry and roofing and siding sheet for farm and industrial buildings.

Aluminum

April 7, 1955



**Send for the new
PRODUCT DESIGN CATALOG,**

containing 24 pages of valuable information on all Kaiser Aluminum Products.

KAISER ALUMINUM & CHEMICAL SALES, INC.
Industrial Service Division
5440 Kaiser Bldg., Oakland 12, California

Please send my free copy of the Product Design Catalog.

Name

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Address

City State

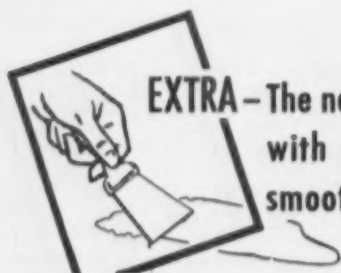
VINOC

LOWE Brothers presents

a new finishing system for high-speed production!

FAST APPLICATION • CLOG-FREE SANDING • IMPERVIOUS TO COOLANTS!

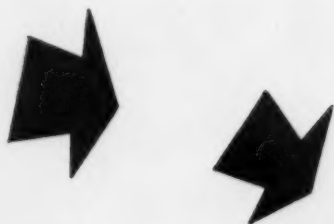
Faster flow of finished castings, reduced handling costs, finishes that resist modern high-speed coolants—these are the demands of today's production. Lowe Brothers "Finishing Specialists" have once more demonstrated their leadership by developing **VINOC**, a finishing system which meets every modern requirement, yet maintains the highest standards of beauty and wearability which made the Lowe Brothers name great!



EXTRA—The new filler in the VINOC system glazes with unprecedented ease, speed and smoothness with knife or squeegee!



ENGINEERED QUALITY



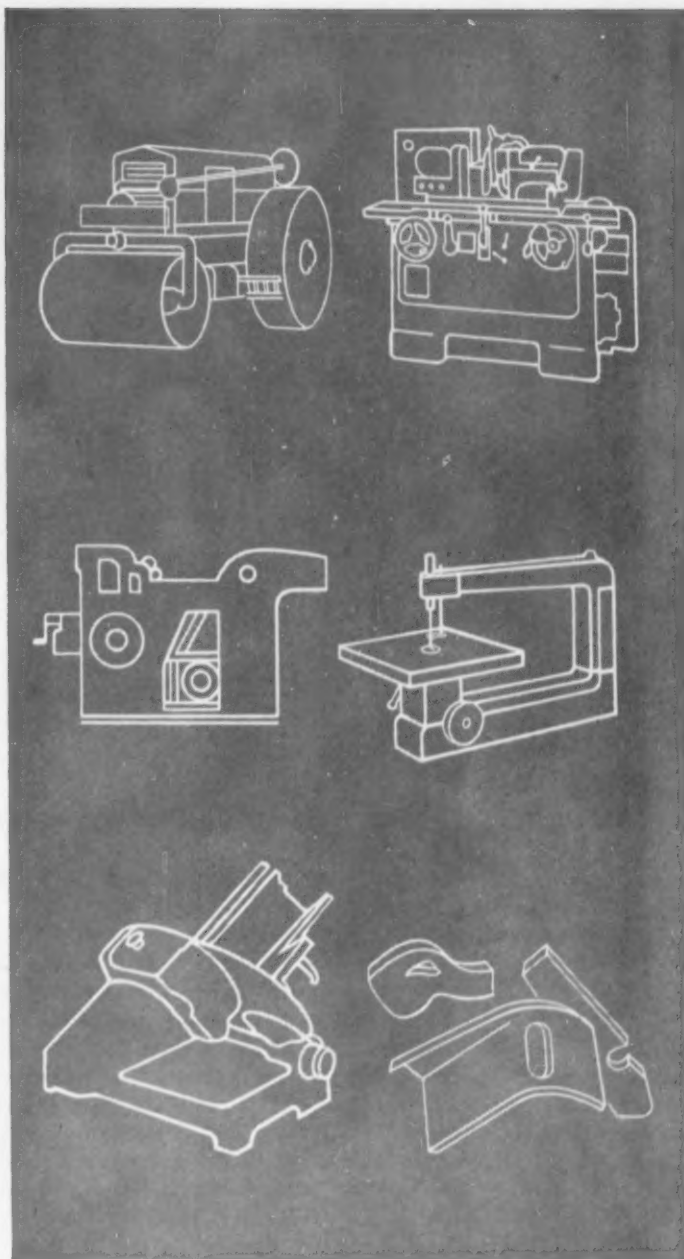
IMPROVED RESISTANCE TO MODERN HIGH-SPEED COOLANTS! Lowe Brothers **VINOC** finishes have proved impervious to all modern coolants to which they have been subjected—to keep in stride with today's requirements of streamlined production techniques!

FASTER, ECONOMICAL CLOG-FREE SANDING! Pigmentation of Lowe Brothers new filler is such that it does not clog sandpaper! It sands easier—desired smoothness is realized in less time with much less work! What's more, you enjoy a marked savings on sandpaper alone!

FASTER DRYING! Lowe Brothers **VINOC** system reduces drying time to a new low—speeds handling. Materials dry free of "pinholing"—as a result there's no re-working necessary!

IMPROVED RESISTANCE TO IMPACT AND COMPRESSION! Large castings take plenty of shocks and scuffs during plant handling operations. Lowe Brothers **VINOC** finishes are made tougher to resist this rough treatment and thereby reduce need for patch work.

Lowe Brothers new **VINOC** finishing system is available for either cold or hot lacquer application. Get full details now—see how you can save time and cost while getting finest finishing results with Lowe Brothers' up-to-the-minute answer to the most modern production needs—**VINOC**! Write today for prompt service without obligation.



LOWE Brothers

FINISHES FOR INDUSTRY SINCE 1870



The Lowe Brothers Company • Dayton 2, Ohio
Industrial Division

District Offices: Atlanta • Boston • Dallas
Chicago • Jersey City • Kansas City



Production of battery manufacturer up 100% since switch to Enamelstrip Coil

and metal inventory is cut in half

Bright Star Industries of Clifton, N.J., found the answer to increased production, lower manufacturing costs, and greater product sales appeal in Enamelstrip Pre-Coated Coil.

It upped production better than 100% by eliminating slitting of sheet stock, stacking of strips, and hand feeding. It lowered inventory of metal by buying Enamelstrip Coil with different colors on either side—and thus permitted use of the same coil for different colored battery tops. It improved product sales appeal by using Enamelstrip Coil to guarantee the

uniformity of finish. It decreased scrap loss, because Enamelstrip Coils can be supplied to the exact width required, and scrap loss is negligible on long coils.

And since its experience with Enamelstrip in the making of battery tops proved so satisfactory, Bright Star has turned to this pre-coated coil for fabrication of other products. Costs are down and quality up on these products too.

Let Enamelstrip work for you in making substantial savings in costs. It is available in widths from 7/32 in. through 30 in., and in thicknesses from .006 to .035 in. in any base metal that will take a coating, and in



Some of the other products being made from Enamelstrip today include: Tags, Toys, Screw Caps, Containers, Buckles, Appliance Accessories, Lighting Fixture Parts, Picture Frames, Envelope Clamps, Flashlight Batteries, Ash Trays, Movie Reels, Venetian Blinds, Electric Stoves, etc.

a wide variety of finishes and colors.
Write or call us for complete details.

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National Sales Representatives for Enamelstrip Corp., Allentown, Pa.



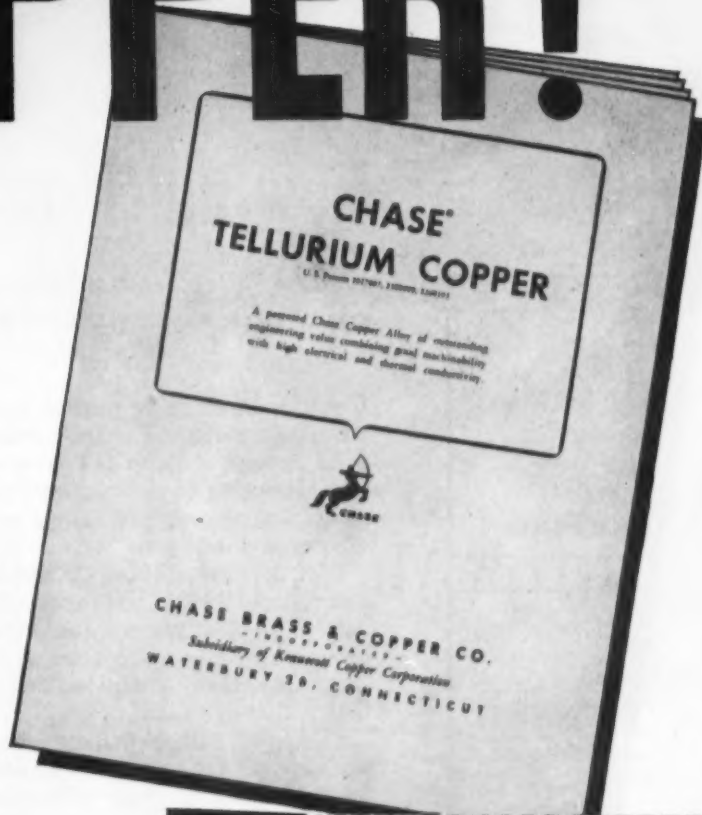
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**Has high conductivity,
good machinability...
saves production time!**

Chase Tellurium Copper gives you the advantages of high conductivity *plus* good machinability.

Chase Tellurium Copper can be machined with tool speeds and settings similar to those used with Free-Cutting Brass, permitting high rates of production. But, unlike Free-Cutting Brass, Chase Tellurium Copper can be *hot worked* easily, and can be cold worked almost as extensively as pure copper.

For more information on Chase Tellurium Copper, check the coupon below.



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Gentlemen:

Please send me your free Tellurium Copper booklet.

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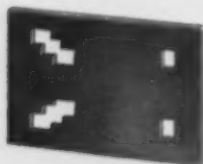
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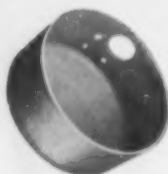
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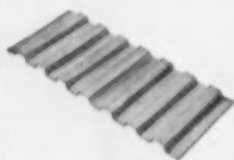
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BENT



How much is it costing you?

STEEL PLATE SHAPES SERVICE CAN HELP YOU CUT SCRAP, INVENTORY AND FREIGHT COSTS

If you're searching for ways to pare production costs, look at pre-formed parts. Savings of 5% to 25% are possible when you buy components already shaped from rolled carbon, alloy or clad steel plate.

With By-Products Steel Co.'s Steel Plate Shapes Service, you pay freight only on material you will use. Plate inventories can be reduced and scrap problems virtually eliminated, saving both dollars and space.

Equipment builders find consistent savings right down the line with pre-formed parts. A wide range of finishes, from as-formed to finish-machined, saves production steps. No costly pat-

terns are needed; Steel Plate Shapes Service works directly from blueprints. Over 150 major machines are available to flame-cut, shear, bend, blank or press your parts.

Located next to the mills of the world's leading producer of specialty steel plate, we can work from plates up to 195" wide or 25" thick, form and heat treat them to your specifications. If you wish to find out how you can use this unique service to cut your production costs, write on your letterhead for Bulletin 712. Address: By-Products Steel Company, 741 Strode Avenue, Coatesville, Pennsylvania.

STEEL PLATE SHAPES SERVICE

BY-PRODUCTS STEEL CO.

A Division of Lukens Steel Company, Coatesville, Pennsylvania



It's outstanding!

EVERY MANUFACTURER who tries Roebling high carbon flat spring steel discovers the same thing...that this spring steel is absolutely unexcelled for dimensional and mechanical uniformity...for speeding production and cutting down rejects.

You always *pay* for the best when you buy flat spring steel...make sure you *get* it by specifying Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.



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world's tallest building.



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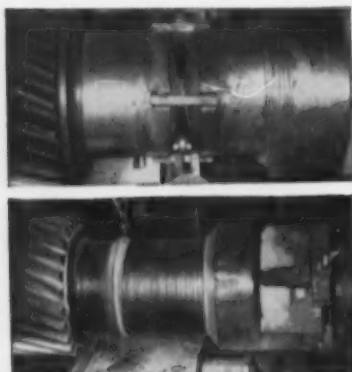
Linde

TRADE-MARK

METALWORKING NEWS

BROKEN 26-INCH PINION SHAFT BACK IN SERVICE THROUGH "UNIONMELT" WELDING

Maintenance engineers at a large Canadian steel mill took a second look at their cost figures when a 26-inch mill pinion shaft snapped because of metal fatigue. Usually, a broken shaft of this size is valued only as so many pounds of scrap steel and the purchase of a replacement part is required at considerable expense. Spurred on by the possibility of large savings, the engineers decided to fabricate a new section and UNIONMELT weld it to the undamaged



(Top) The two sections of the shaft are assembled on a 4-in. plug and held rigidly by temporary tie-bars. (Below) The welding is completed by making a surfacing weld over the entire length.

end. First, the new section and the broken end of the pinion shaft were machined back to form a beveled joint. A 4-in. hole was then cut in the centers of both sections and a plug inserted for alignment purposes. Reinforcement bars were tack-welded across the joint to maintain alignment while the parts were placed in a rotating positioner. The reinforcement bars were then cut off and the joint was preheated to 700 degrees Fahrenheit with oxy-acetylene flame-heating heads. A UNIONMELT DS welding head was used to deposit over 275 lb. of weld metal in the vee making a sound, porosity-free joint. The welding was completed by making a surfacing weld over the entire weld area. The shaft was then machined and put back into operation at a fraction of the cost of a new part.

Call your nearest LINDE Office today and find out how you can cut costs and save time in your plant maintenance operations with UNIONMELT welding.



Shot holes are made with a powder-lance in 1/4 the time needed by previous methods.

SLAG POCKET SHOT HOLES PRODUCED IN 1/4 THE TIME WITH POWDER-LANCING

Before an open hearth furnace can be rebuilt the slag pocket contents and brickwork have to be blasted loose. This practice requires the making of shot holes in which the charges are placed. In the past these shot holes were produced by drilling with wagon drills, hand operated pneumatic drills, or sometimes by using hollow refractory sections... all costly and time consuming methods. LINDE engineers recommended powder-lancing using a mixture of aluminum and iron powder to create the extremely hot exothermic reaction

needed to pierce the firebrick, slag, and hard inclusions. Producing six shot holes in a 250-ton capacity furnace by mechanical means requires up to 24 hours of drilling. With powder-lancing the job can be completed in 6 hours—only 1/4 the time. The holes can be lanced at any time during the furnace production cycle because the powder-lanced holes retain their shape and size for weeks.

Call your nearest LINDE office today and find out how powder-lancing can be used to cut your open hearth furnace production and maintenance costs.

POWDER STARTING BOOSTS PRODUCTION, LOWERS COST



Powder-starting upped production 40% and cut costs 30% in this billet cut-off operation.

A southern manufacturer of steel products reports a production increase of 40 per cent and a reduction in total unit cost of 30 per cent with the introduction of powder-starting in an oxy-acetylene cut-off operation. It was estimated that a standard cutting blowpipe required a minimum of 18 seconds to

start cuts in 6-in. steel gothic squares. Powder-starting was added by attaching a powder-cutting adapter to the standard oxy-acetylene cutting blowpipe. Now, cuts are started in 1 1/2 to 3 seconds.

In powder-cutting an iron-rich powder is added to the oxygen stream to develop an extremely hot cutting flame. The powder-cutting process makes the cutting of stainless steels, cast iron, or non-ferrous metals an efficient, economical operation.

Ask your nearest LINDE representative how you can increase production and lower costs with powder-starting and other powder-cutting processes.

LINDE AIR PRODUCTS COMPANY

A Division of Union Carbide and Carbon Corporation
30 E. 42nd St. New York 17, N.Y.

Offices in Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

The terms "Linde" and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

OVERHUNG ROTOR DESIGN

simplifies compressor installation and
eliminates outboard bearing alignment problems

1 PERMANENT, BUILT-IN ALIGNMENT

Rotor support bearing cast integral with crankcase.

2 NO OUTBOARD BEARING

No alignment problems.

3 FLOATING ROTOR

While operating, rotor weight is supported on a cushion of magnetic force.

4 EASE OF INSTALLATION AND MAINTENANCE

Just set the stator down and slide it in place.

5 NO FLYWHEEL REQUIRED

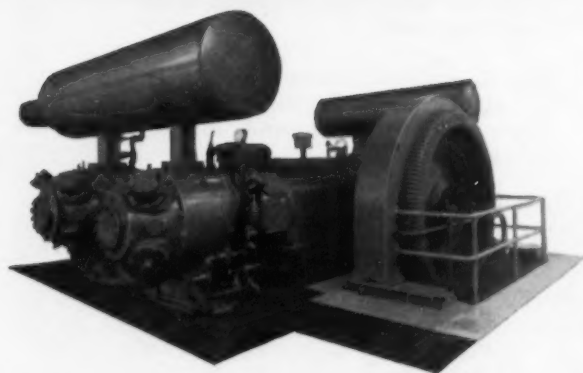
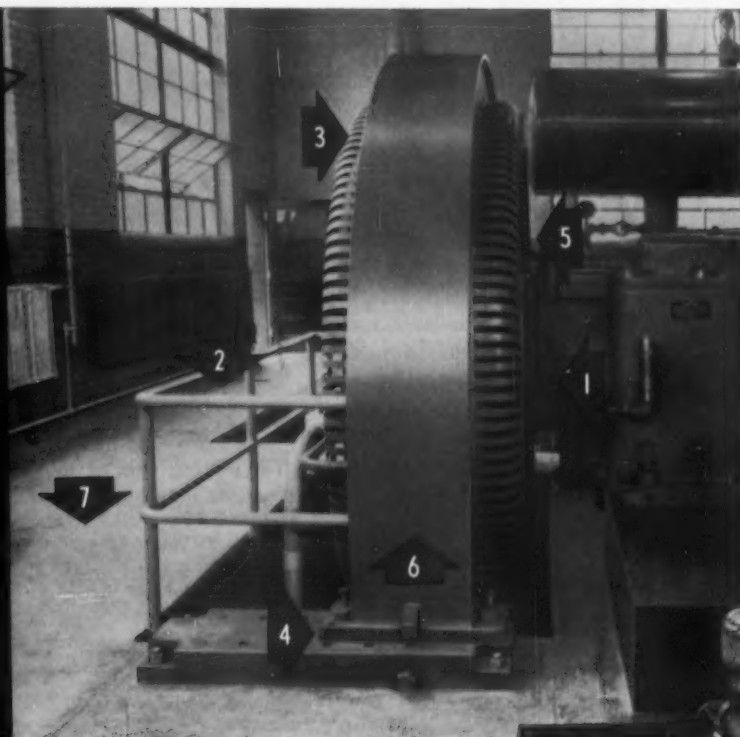
Flywheel effect built into rotor.

6 ONE-PIECE STATOR

Elimination of stub shaft and outboard bearing permits use of one-piece stator and collector rings.

7 SAVES FLOOR SPACE

Close coupling reduces foundation size and floor area.



CLARK BROS. CO. • OLEAN, N. Y.

ONE OF THE DRESSER INDUSTRIES

Sales Offices in Principal Cities throughout the World

One of the many exclusive features of Clark Balanced/Opposed Compressors is the overhung rotor design.



With it, compressor installation is greatly simplified, floor space requirements are substantially reduced and alignment problems (inherent with outboard bearings) are non-existent. Furthermore, elimination of the outboard bearing precludes bumping it out of alignment.

When the unit is operating, the magnetic lines of force fully support the rotor, with practically no weight carried by the integral bearing or shaft. Alignment is permanently built into Clark Balanced/Opposed Compressors.

For complete details on America's first and foremost Balanced/Opposed Motor-Driven Compressor—the compressor with *perfect balance*—write for Bulletin 118 and consult with your nearest Clark representative.

PRECISION BY THE TON

CLARK

balanced/opposed compressors

150-4500 HP

April 7, 1955

NICKEL-LUME

FOR BRIGHT NICKEL BARREL PLATING

The H-VW-M Nickel-Lume Barrel Plating Process is ideal for producing bright-from-the-barrel decorative nickel coatings on small automotive parts, jewelry, novelties, nail clippers, files, hardware, fasteners, screws, and similar items. The new process is an application of Nickel-Lume, which made its appearance a year ago as an outstanding development in a bright nickel for rack plating.

Barrel installations have been in operation in the field for some time with many enthusiastic users. An important feature of this bright-nickel barrel process, is the consistency of color maintained even in recessed areas, as in hard-to-plate threaded parts. Subsequent chromium plating can be handled with ease since the nickel deposit is very active and, unlike many bright barrel processes, is not brittle.

Advantages of Nickel-Lume Barrel Plating are:

Uniform Brightness—deposits, right out of the barrel, are uniformly bright with a pleasing "clean," white color even in hard-to-plate areas.

Low Stress—deposits are ductile and have a low compressive or tensile internal stress.

Activation Not Required—no activation is required between the nickel and chromium or other subsequent deposits.

High Tolerance To Impurities—organics are tolerated in greater concentrations than in other bright baths.

Complete Control—complete analytical control of all constituents.

Wide Operating Range—current density and temperature have a wide range with no resultant loss of brightness.

Good Corrosion Resistance—nature of the addition agent plus constant deposit characteristics give a high level of protection to the plated surface.

Stability—not a "fussy" bath—remarkably stable over long periods of operation.

Nickel-Lume for Barrel Plating is the direct result of continuous research conducted at H-VW-M . . . another example of Platemanship in action. Complete details and a new instruction manual will be forwarded on request.

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO. • MATAWAN, N. J.

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H-VW-M

1216

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES



Want prolonged paint adherence?

Weirzin

ELECTROLYTIC ZINC-COATED SHEET

How to paint, enamel, lacquer or lithograph metal parts is often a perplexing problem. Poor adherence means dissatisfied customers.

Weirzin has a simple solution, proved highly satisfactory, in a tight malleable zinc coating that is *actually part of the steel*. The coat remains intact even under extreme temperature and humidity. What's more, neither punching nor forming nor deep drawing can rupture the even deposit. Thus underfilm corrosion cannot form and, as a result, paint does not crack, chip or flake.

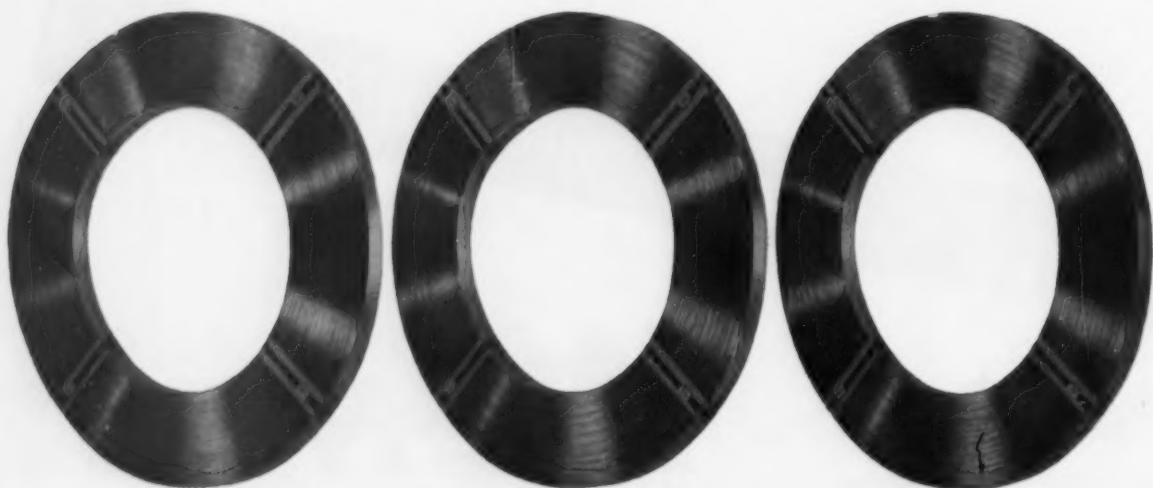
This electrolytic zinc-coated steel—with or without chemical treatment—is available in coils, in cut lengths, in all regular widths and gauges. Find out how easily leading manufacturers satisfy their customers with this exceptional product. Phone or write now.

WEIRTON STEEL COMPANY

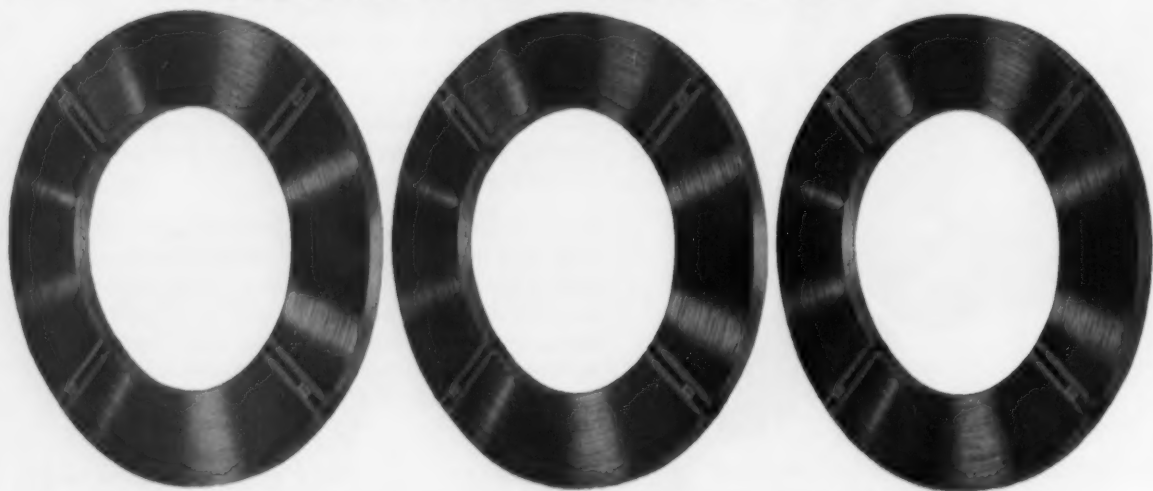
Weirton, West Virginia

NATIONAL STEEL CORPORATION





call **CRUCIBLE** for a



**full range of COLD ROLLED
specialty steels**



Look to Crucible for highest quality cold rolled specialty steels. You'll find a wide assortment of alloy strip and carbon spring steels . . . in many analyses, sizes, shapes and finishes.

Crucible, the nation's leading producer of *special purpose steels*, controls steel production from ore to finished product. And special Crucible-patented machines bring you cold rolled steels with *finer finish* . . . better edges . . . closer than standard tolerances.

When you have a cold rolled specialty steel application, call Crucible in during the *planning* stage. Crucible engineers can help you develop the specification . . . and knowing the end use for the steel, will prescription-make it to suit your needs—in coils or cut to your particular length requirements. Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.

CRUCIBLE

first name in special purpose steels

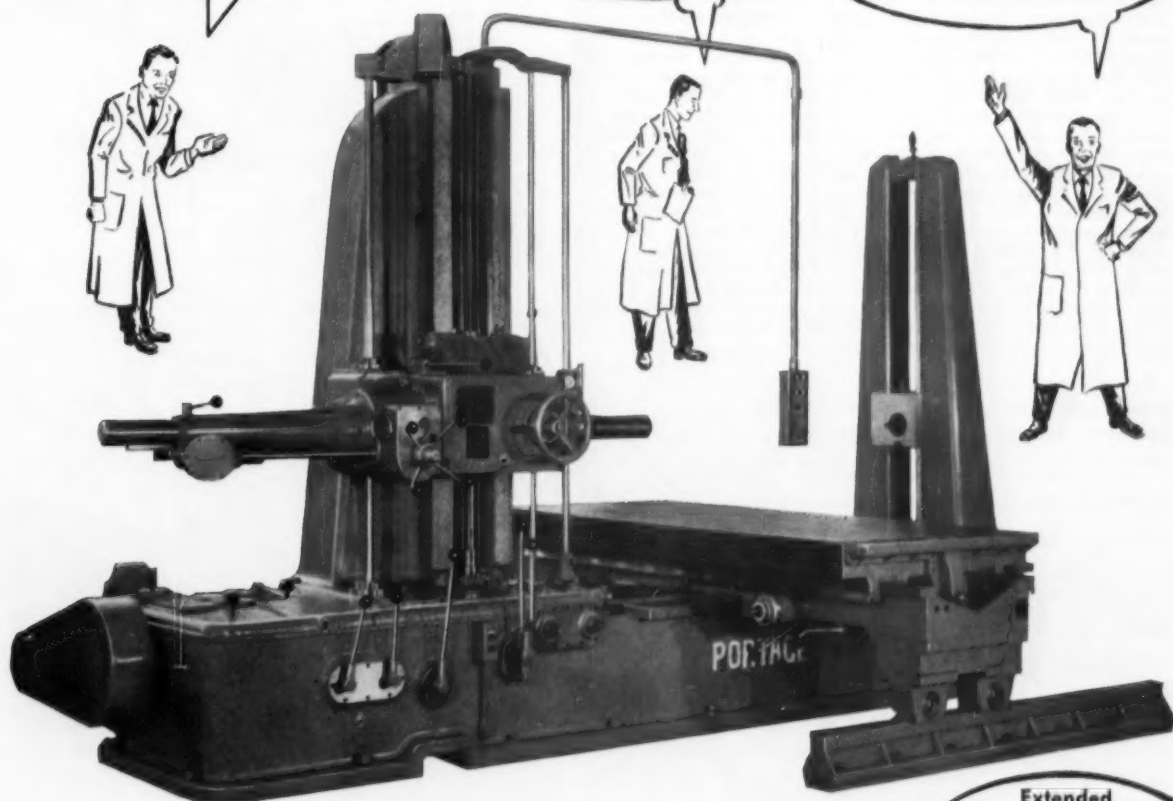
Crucible Steel Company of America

CHECK THESE *Features...*

4" spindle diameter,
precision machined
nitralloy steel.

Pendent controls include
spindle rotation, forward, re-
verse, jog forward, jog reverse
and stop.

36 spindle speeds
8-1000 R. P. M. 18 Feeds.



Unusually wide and
deep base, cast entirely in
one piece . . . offers
excellent rigidity.

Extended
table saddle with
adjustable supports
and runways makes
it possible to handle
the big jobs, too!

PORTAGE MACHINE PRICES START AT \$31,358 COMPLETE. The PORTAGE Horizontal Boring, Drilling and Milling Machine is a precision built tool. Only the finest of materials and workmanship go into its manufacture . . . and at a comparatively lower cost. Get ALL the facts . . . write for literature and specifications . . . TODAY.

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BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

April 7, 1955

65

YOU BUY ONE MACHINE . . . GET THE PERFORMANCE OF TWO

BROWNHOIST diesel-electric locomotive-cranes double as switch engines

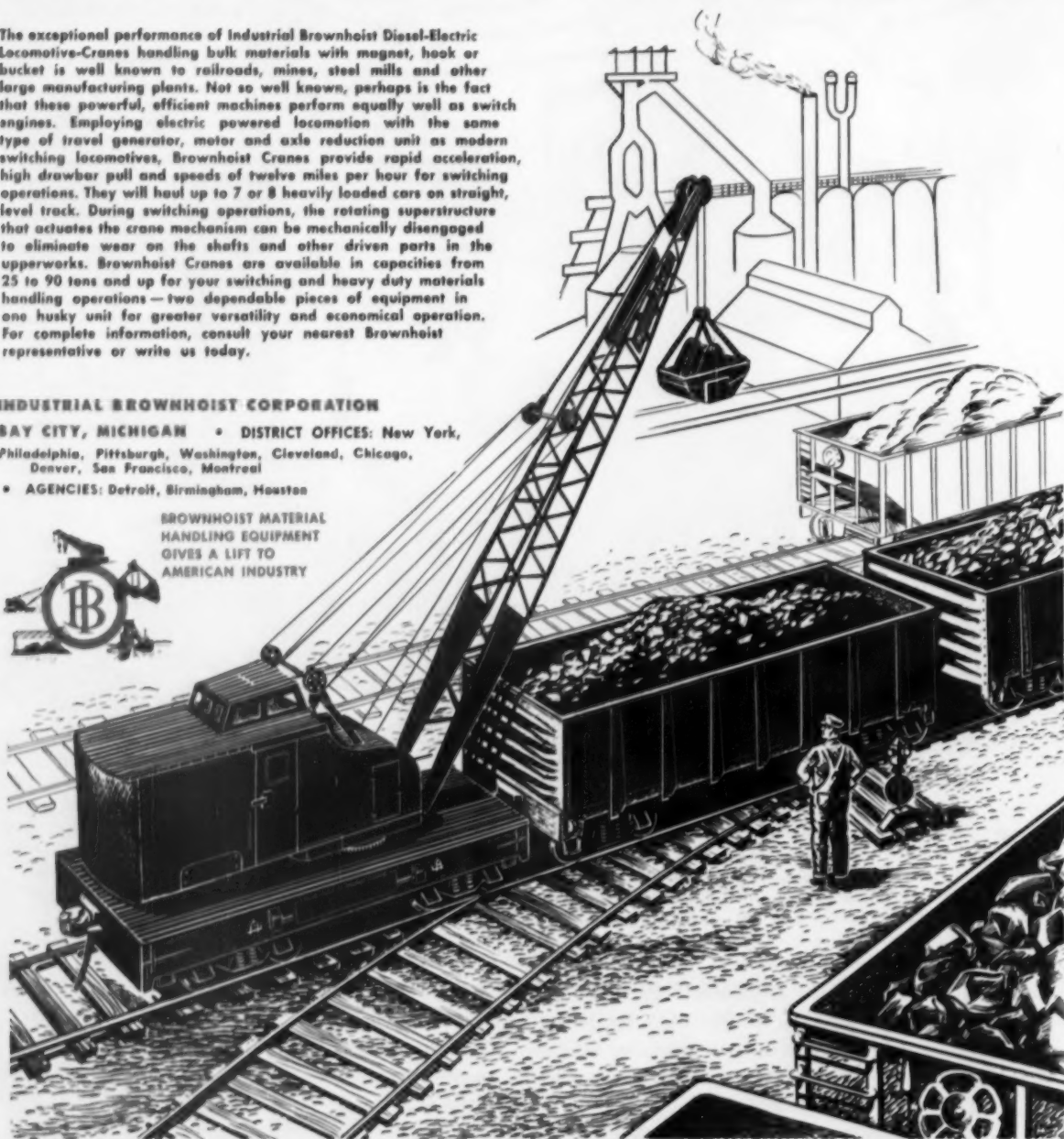
The exceptional performance of Industrial Brownhoist Diesel-Electric Locomotive-Cranes handling bulk materials with magnet, hook or bucket is well known to railroads, mines, steel mills and other large manufacturing plants. Not so well known, perhaps is the fact that these powerful, efficient machines perform equally well as switch engines. Employing electric powered locomotion with the same type of travel generator, motor and axle reduction unit as modern switching locomotives, Brownhoist Cranes provide rapid acceleration, high drawbar pull and speeds of twelve miles per hour for switching operations. They will haul up to 7 or 8 heavily loaded cars on straight, level track. During switching operations, the rotating superstructure that actuates the crane mechanism can be mechanically disengaged to eliminate wear on the shafts and other driven parts in the upperworks. Brownhoist Cranes are available in capacities from 25 to 90 tons and up for your switching and heavy duty materials handling operations—two dependable pieces of equipment in one husky unit for greater versatility and economical operation. For complete information, consult your nearest Brownhoist representative or write us today.

INDUSTRIAL BROWNHOIST CORPORATION

BAY CITY, MICHIGAN • DISTRICT OFFICES: New York,
Philadelphia, Pittsburgh, Washington, Cleveland, Chicago,
Denver, San Francisco, Montreal

• AGENCIES: Detroit, Birmingham, Houston

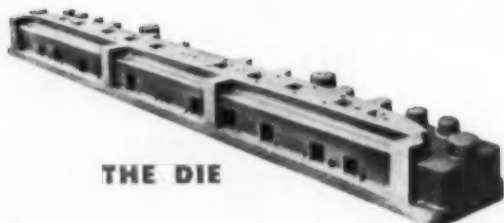
BROWNHOIST MATERIAL
HANDLING EQUIPMENT
GIVES A LIFT TO
AMERICAN INDUSTRY



BROWNHOIST

BUILDS BETTER HEAVY DUTY MATERIALS HANDLING EQUIPMENT

AT NEMCO FOUNDRY: ANOTHER PROBLEM SOLVED BY CITIES SERVICE CORE OIL



THE DIE

The die pictured here was cast at Nemco Foundry for use by the Spartan Aircraft Company in producing roof ribs for its Spartan Mobile Home. Difficult to produce, it required 10 cores $2\frac{5}{8}$ " x $2\frac{5}{8}$ " square and 25 cores, quarter-circle in shape, from $\frac{3}{4}$ " to 1" in diameter. Semi-circular shape was necessary to core curved slots from top of die to sides. Holes had to be clean and free from obstruction, allowing stamped slugs to fall through. Nemco relied on Cities Service Delco Core Oil to help meet exact specifications. "A smart choice," says J. A. Dean, General Manager. "Delco Core Oil made the job far easier."



THE ROOF RIBS

The roof ribs of this Spartan trailer, cast from the die produced at Nemco, are visual proof of a job well done. "The great strength and high collapsibility of Cities Service Delco Core Oil share a lot of the credit," says Nemco.



THE FINISHED PRODUCT

The finished product is this handsome Spartan Mobile Home awaiting shipment to consumer. Spartan's rigid specifications help make it one of the safest and best on the market.

Difficult casting of die to form roof ribs for Spartan Mobile Home made easier by Cities Service Delco #36

Located in Tulsa, Oklahoma, Nemco Foundry enjoys attacking the really tough jobs and making them easier. And often helping to spearhead the attack is Cities Service, as described here by J. A. Dean, General Manager:

"Recently Cities Service Delco #36 Core Oil again solved a tough job for us in fulfilling the requirements for a casting for the Spartan Aircraft Company, makers of Spartan Mobile Homes. The casting was a bottom shoe for blanking die to make roof ribs for the all-aluminum shells for Spartan trailers.

"The die was of Nemcoloy, Type AL, an alloyed grey iron. It was 106" long, 8" thick and $13\frac{1}{2}$ " wide, and weighed 2,018 lbs. cleaned.

"It required 10 cores $2\frac{5}{8}$ " x $2\frac{5}{8}$ " square. In addition, it demanded 25 cores, quarter-circle in shape, ranging from $\frac{3}{4}$ " to 1" in diameter. Semi-circular design was necessary in order to core curved slots from the top of the die to the sides of the die. Holes had to be clean and free of obstructions allowing the stamped slugs to fall through the die to the outside and not hang up.

"Cities Service Delco #36 Core Oil enabled us to meet these requirements perfectly. We certainly recommend it where great strength and high collapsibility are needed."

Like Nemco, scores of other foundries have reported unusual results with problem-solving Cities Service Core Oils. Nor does the praise end with the product . . . for time and again the solution for the proper core oil has resulted from the knowledge, understanding and experience of a Cities Service Lubrication Engineer. If you have a lubrication problem, why not talk it over with one of these Cities Service experts? Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS



Why SANDVIK has so many different kinds of high carbon and alloyed steel

SANDVIK high carbon and alloyed steels are *specialized* steels. Each type is fitted for a specific service; "custom-tailored" to meet certain exacting physical demands.

Purity of raw materials, special analyses, highly developed techniques in processing and finishing—these are all factors in the production of specialized SANDVIK steels.

If you have an application that calls for unusual physical characteristics and quality in high carbon or alloyed strip steel, 'phone or write SANDVIK.

You can get Sandvik steels

- In special analyses for specific applications
- Annealed, unannealed or hardened and tempered
- With bright finish or blue or yellow polished
- With round edges or square edges
- In a wide range of thicknesses from .001".

You can get complete information, promptly, on request.

55-24

SOME SANDVIK SPECIALTY STRIP STEELS

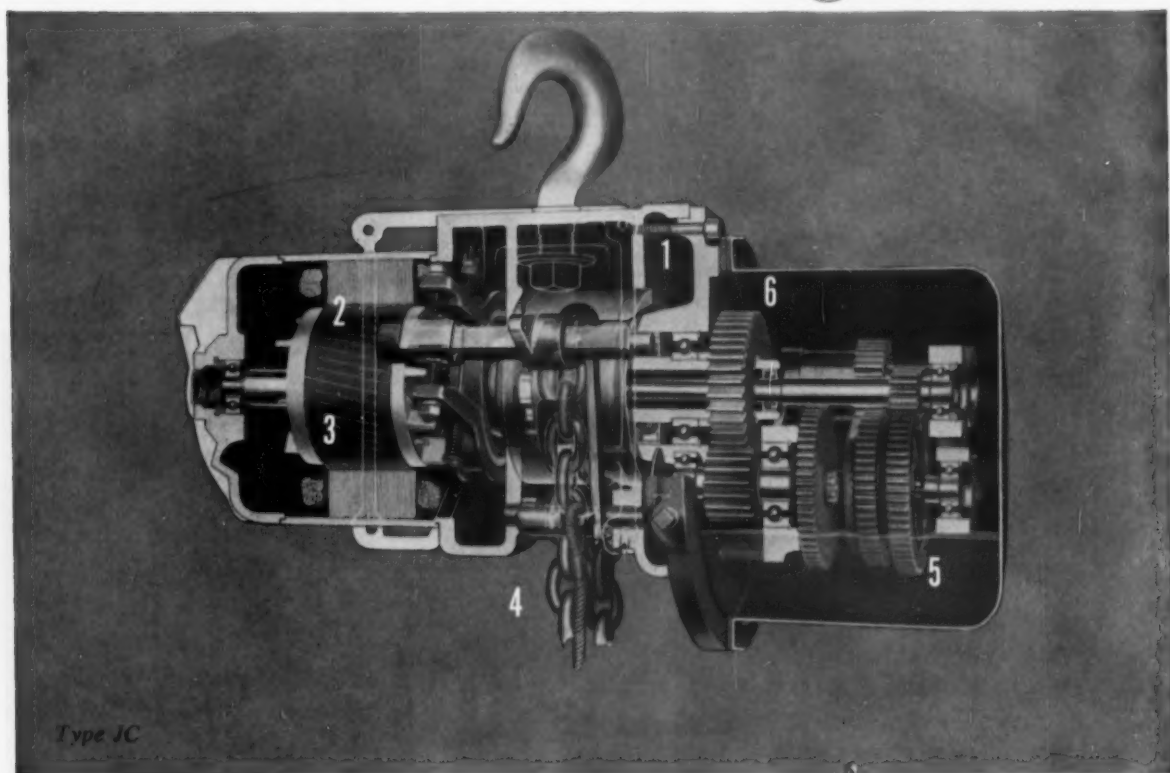
Band Saw Steels • Camera Shutter Steel • Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Flapper Valve Steel • Knife Steels • Matrix Band Steel • Needle Cutter Steel • Piston Ring Segment and Expander Steels • Razor Blade Steel • Reed Steel • Shim Steel • Shock Absorber Steel • Sinkers Steel • Spring Steels • Textile Steels • Vibrator Reed Steel



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TAKE IT UP WITH  HOISTS-CRANES-WINCHES



100 POUND GIANT—FOR 2000 POUND LIFTS

That's the Robbins & Myers JC electric chain hoist. Light weight for portability—high safety factor, combined with reliability and long life. Priced to justify power lifting for jobs now being done manually.

- 1 **FRAME**—Unit cast aluminum alloy, tensile strength 37,000-40,000 psi.
- 2 **MOTOR BRAKE**—Shoe type of ample area to stop hook quickly—assure accurate load spotting—long life.
- 3 **MOTOR**—½ HP Robbins & Myers, heavy duty rating.
- 4 **CHAIN**—Welded alloy steel. Withstands pull in any direction.
- 5 **LOAD BRAKE**—Weston type with non-reversing clutch.
- 6 **GEARS**—Precision cut from alloy steel, heat treated.

JC is available in 500, 1000 and 2000 pound capacities. Hook mounting and rope control are standard. Push type trolleys available for overhead rail installations. Low prices start at \$188.

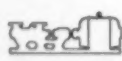


BRING YOUR R & M HOIST DATA FILES UP TO DATE. SEND FOR FREE BULLETIN.

- ☐ Send Bulletin No. 852 ☐ Have Representative call



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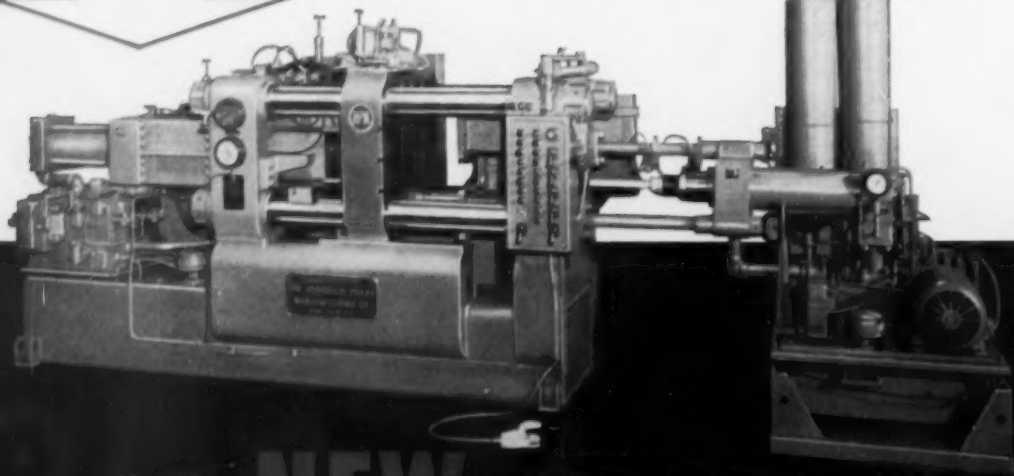
SPRINGFIELD, OHIO

BRANTFORD, ONTARIO

April 7, 1955

ALL NEW SELF-CONTAINED CLAMP END

ALL NEW SELF-CONTAINED INJECTION END



A NEW APPROACH TO DIE CASTING

New H-P-M Die Casting Machine offers more than just New Machine Design

The new H-P-M die casting machines are being hailed as the most important advancement in die casting in fifteen years, and rightly so . . . more than forty new and improved features! These features result in minimum mold flash . . . faster die set-up . . . greater versatility in die usage and casting design . . .

reduced maintenance . . . maximum safety and performance. The new self-contained Link-Wedge mold clamp is the best. There's plenty of "beef" in these new models. They are available in a complete range of sizes . . . cold chamber or gooseneck types.

Write for Bulletin 5400 which describes these new units in detail.



THE HYDRAULIC PRESS MFG. COMPANY

1006 Marion Road, Mount Gilead, Ohio, U.S.A.



METAL WORKING PRESSES

PLASTICS MACHINES

DIE CASTING MACHINES

C-PRESSES

POWER EQUIPMENT

ROLLWAY

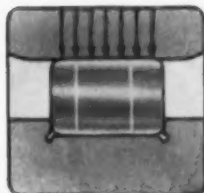
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ROLLER BEARINGS

**...up-to-the minute
design...
plus economy**

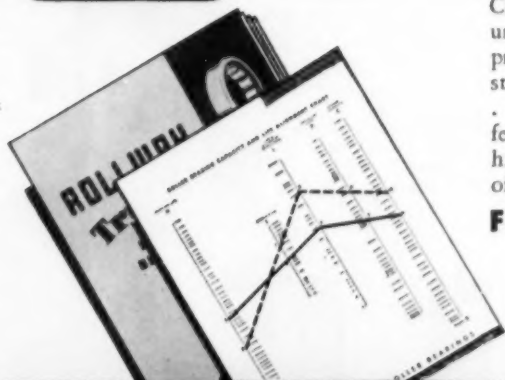


All Tru-Rol Bearings Now Have



**CROWNED
ROLLERS . . .**

Crowned Roller under full load — stress uniformly distributed.



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April 7, 1955

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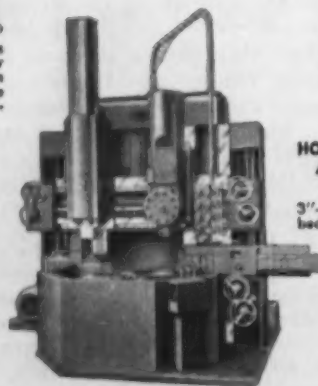
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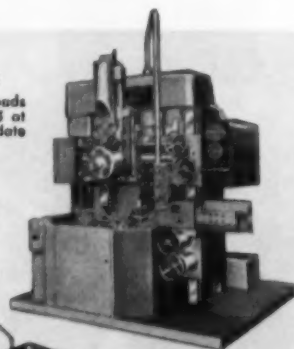
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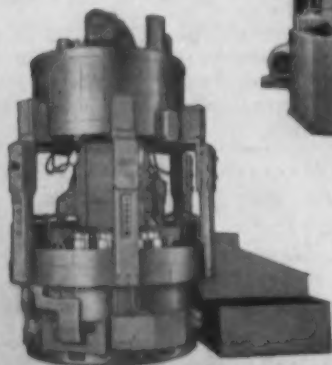
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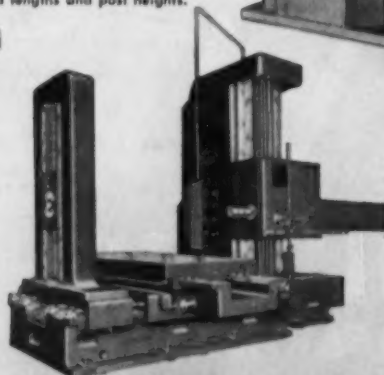
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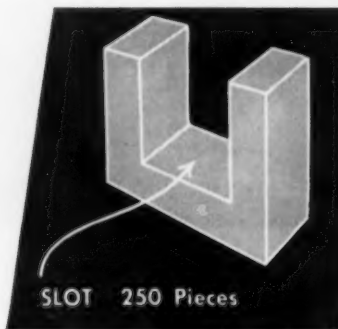


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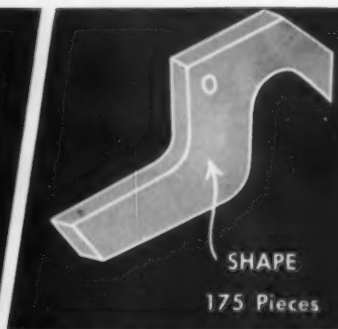
3"-4" and 5" spindle with various bed lengths and post heights.



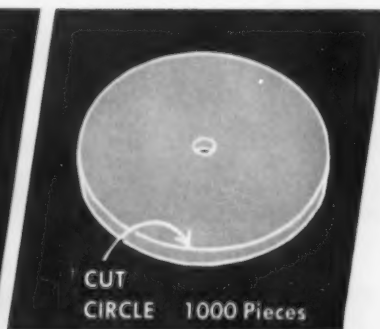
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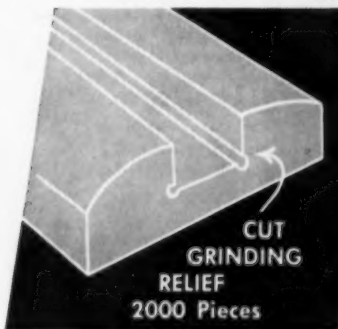
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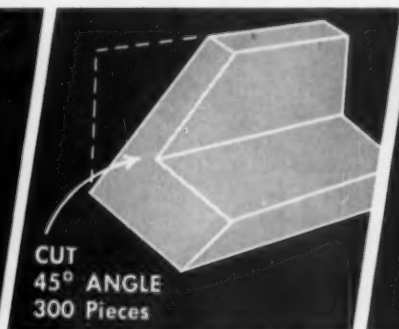
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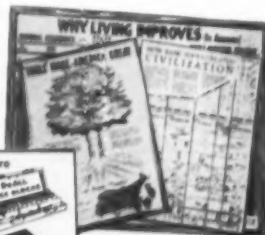


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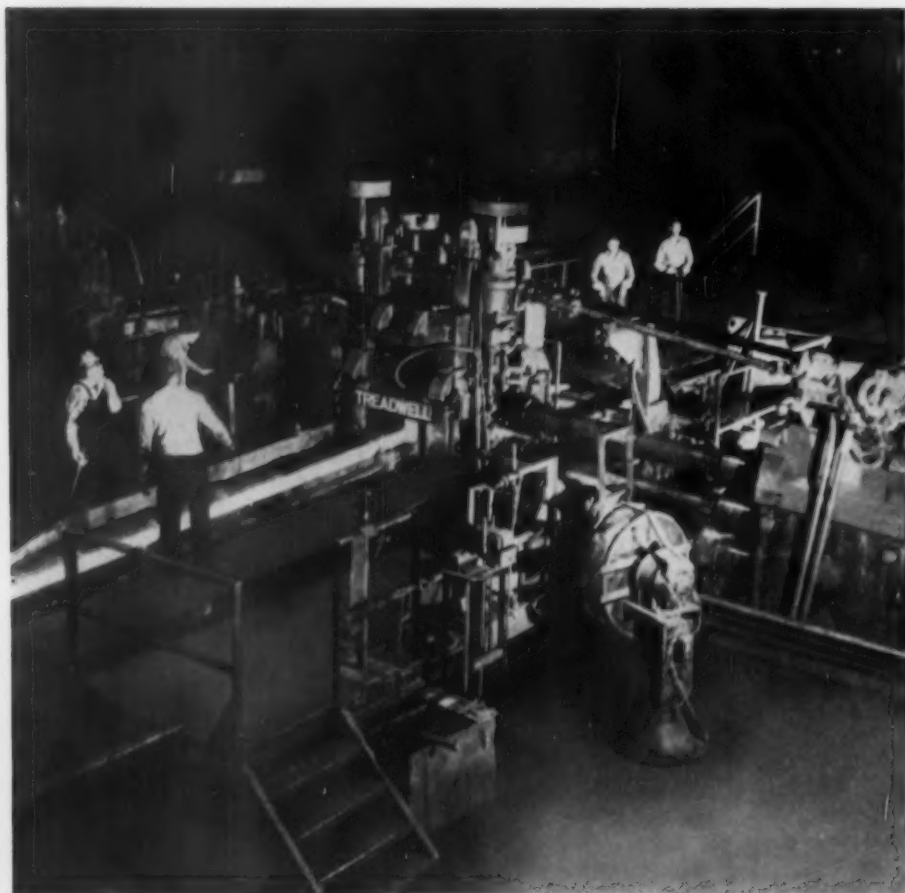


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1

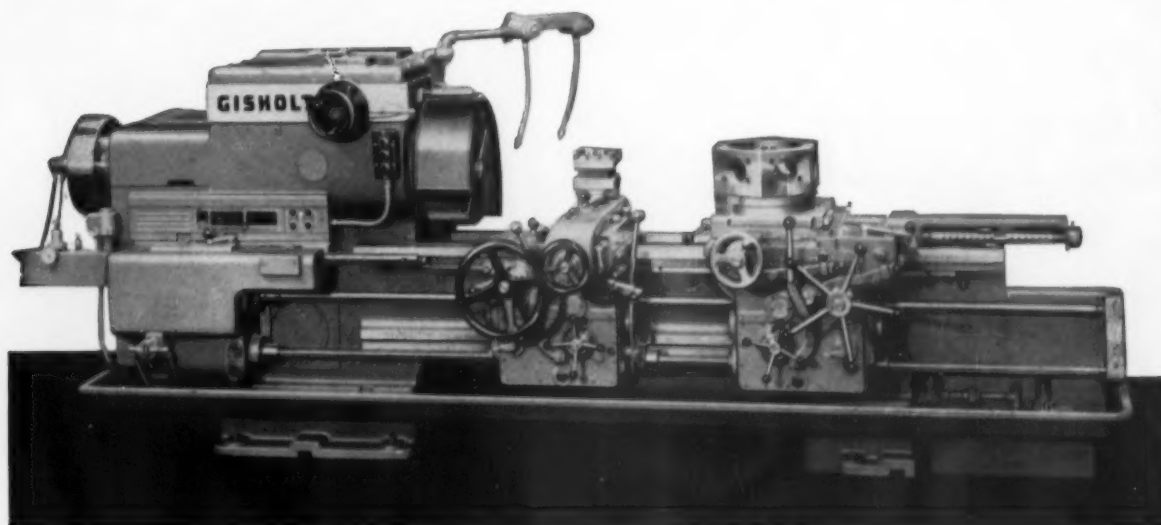
All gears in Gisholt turret lathe transmissions are high carbon alloy steel, precision ground after heat-treatment to assure long wearing quality. All shafts turn on antifriction bearings, with pressure spray lubrication. Headstock is cast integral with bed for extreme rigidity—to maintain accurate, permanent alignment.

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Gisholt's thick, block-type ways are automatically pressure lubricated. Made of SAE 52100 tool steel, they are deep hardened to 64-66 Rockwell C and then finish-ground for exact alignment with the spindle. On top, bottom and both sides, they present a bearing surface that is virtually wear-proof—accurate for years to come.

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Aprons are fully enclosed, all working parts protected and operating in a continuous cascade oil bath. Alloy steel gears and shafts are mounted on antifriction bearings. Positive serrated feed and traverse clutches cannot slip or drag. Safety shear pins protect feed and traverse mechanism against overload and accident.



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THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

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TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

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When the "Silver Campaign Depression" made it difficult to feed our horse, let alone meet the company payroll



when kitchen stoves were cast iron —
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When high labor costs mean more production per machine per hour to make a profit . . .

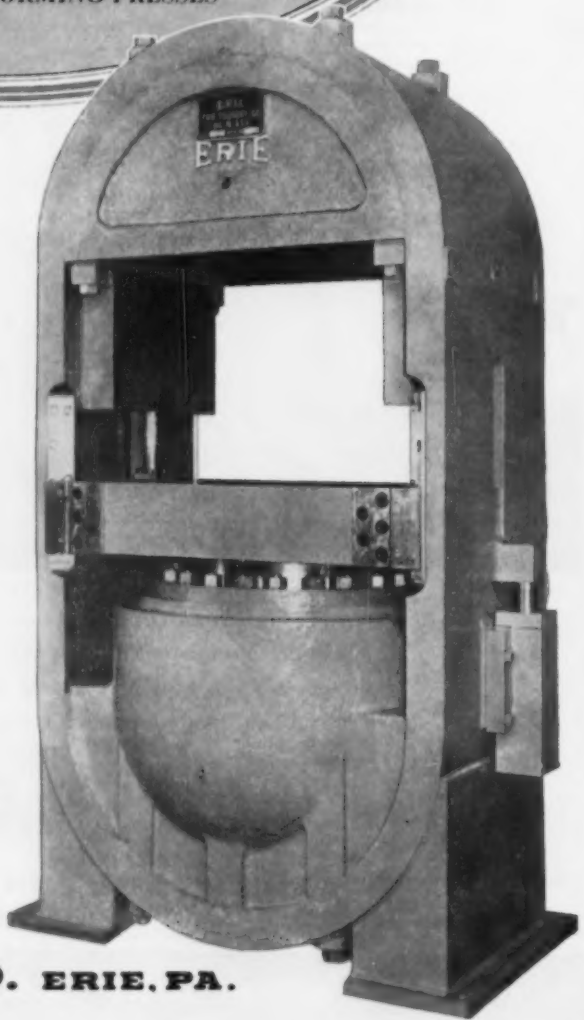
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When minimum deflection (less than .002") means almost perfect die matching . . . almost perfect parts . . .



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MOULDINGS of

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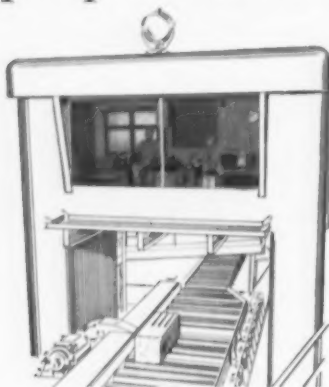
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Here's *usable beauty* for exacting service . . . wear-resistant, hard, bright and strong throughout! SUPERIOR STAINLESS forms smoothly and easily because it is uniform in every physical quality: facts proved by the mile in mouldings manufacture every day. • May we serve *your* stainless steel strip applications?

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AUTOMATIC-POSITIONING Control

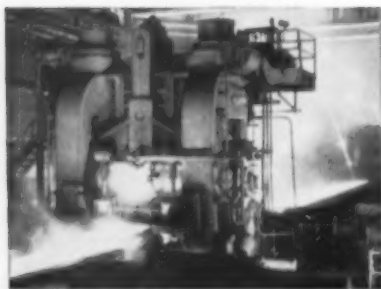
sets blooming mill screwdowns
to *pin point* accuracy . . .



Reduces roller's tasks 1/3

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New operators learn
faster

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Accurate drafts reduce
rejections



On plate mills and roughing stands, edger rolls and side guide movements can be automatically coordinated with screwdown movements.



Indexes *automatically* from pass to
pass to speed rolling and cut costs . . .

To meet the challenge of ever-increasing costs, rolling mill management-teams are turning to automatic operation of screwdowns and associated drives. Precise roll drafts give a higher quality product and new operators become seasoned in a shorter time. Removing the need to coordinate the screwdown with mill reversal enables the roller to concentrate on the manipulation of main motor and work tables for faster and more efficient operation.

The roller pushes a momentary-button only once for each pass, and the rolls are driven to the exact pre-selected settings . . . no overtravel with subsequent inching into position. The operation is entirely automatic for each complete rolling schedule.

This EC&M Automatic-Positioning Screwdown Control system is readily applied to ferrous and non-ferrous mills. New Booklet 9250 fully describes this control and shows many interesting installations. Write for your copy.



THE ELECTRIC CONTROLLER & MFG. CO.
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6187

The Iron Age Newsfront

Copper: No Ease in Sight

Copper has become the inflationary factor in the metalworking industry. Continued labor unrest in mining areas and continued high rates of world consumption will prevent an early easing in the market. Substitutes do not fill the void between supply and demand.

Salt Baths Cut Die Treating Time

A large eastern firm has cut heat treating time on its own forging hammer dies by as much as 36 to 48 hours. Use of salt baths for this purpose has given exceptionally good results. The firm now plans to treat the largest dies in the plant by the same method.

Limit on Hardness Improves Tappet Life

Hardenable cast iron tappet material performs best when the hardness range is 302 to 341 Bhn on the face end in the as-cast condition. Lower hardness produces increased fatigue and wear tendency; higher hardness shows an increased tendency to scuff. A specific microstructure may be obtained by either furnace or induction hardening.

Ceramic Coatings Make Good

Industry is benefiting from military experience with refractory ceramic coatings on metals. New formulas, lower cost techniques make coatings worth a look where service temperatures exceed 1200°F. Substitution of lighter gage metals and use of mild steels for higher alloy grades are possible under some conditions.

Machine High-Hardness Steel

One firm has resorted to machining low-alloy high-hardness steel (55Rc) in finishing heat treated sections to close tolerances. Because of the high stresses in the hardened sections, machining is used rather than grinding to avoid the risk of cracking.

Auto Producers Act on Steel Needs

Automotive steel buyers are acting on the assumption there will be continued labor peace in their industry. Commitments are being made for mid-third quarter steel requirements. This also bespeaks optimism over sales prospects in last half.

Heat Pump May Level Current Demand

Pressure for home consumer use of the heat pump will begin to hit a little harder this summer. With a year-round current requirement, it could help power suppliers by leveling off summer loads brought about by the air conditioning boom. Some consumer products will be ready this year.

Mills Weigh Orders Against Nickel Supply

Despite recent relief from government stockpiles, the nickel shortage seems bound to affect production of alloy and stainless steels. Mills are following the picture very closely, carefully weighing new orders against the availability of nickel.

Aluminum: Eager for Nuclear Power

Among those most eagerly awaiting the atomic power era are power hungry aluminum producers. It's expected that atomic power will make possible use of smaller primary aluminum production units which could be located near natural markets. This would eliminate aluminum's current problem of being forced to set up huge facilities in out-of-the-way places where water power is available.

Plan Expansion of Steel Facilities

Steel industry in the southeast is reportedly in for another major expansion soon in hot and cold rolled sheet facilities. Although one expansion was announced only a few weeks ago for 48 in. sheet, a new mill which would turn out 60 in. or wider sheets is reportedly being planned by the current lone producer.



Another B&W Mechanical Tubing Application

BIG BROTHER TO A DENTAL DRILL

"Painless," efficient drilling of primary blast holes in the earth's rock crust—by either percussion or rotary action—is a cinch for Ingersoll-Rand's heavy-duty Quarrymaster. But its greatest advantage lies in the built-in hole cleaner, made possible by using B&W Mechanical Tubing for the drill rod. An automatic, continuous stream of compressed air is forced down through the tubular drill rod to the bit and back up, between drill rod and casing, to the surface, carrying the cuttings with it. And

this hollow drill rod has been proved stronger, lighter and more rigid than a solid bar.

To satisfy vital requirements such as long life under extreme conditions of impact, B&W imparted desirable cold-worked properties to this tubing and also devised a special hot-upsetting procedure. With Quarrymasters now in service all over the world, the effectiveness of their drill rods made of B&W Mechanical Tubing has long since been decisively demonstrated.

For a comprehensive story of how B&W Mechanical Tubing serves many industries, ask for Technical Bulletin 361 1A



**THE BABCOCK & WILCOX COMPANY
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Beaver Falls, Pa. and Milwaukee, Wis.:
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TA-5003(M)

VACATIONS: Back to Normal in '55

Better business will mean fewer extended plant shutdowns this year . . . But most metalworking plants plan normal vacation schedules . . . Union contracts a factor . . . Stampers too busy to take rest this year.

♦ **WITH BUSINESS** booming, U. S. metalworking plants are thinking twice about vacation shutdowns this year in contrast with 1954 when plant closings aggravated the summer slump.

THE IRON AGE editors found top management in numerous industries delaying a decision on whether to close up shop or stagger vacations. There was no such hesitation last year. In fact, extended plant vacation shutdowns were a necessity for many companies in 1954.

Plant closings in '55 will be limited to those industries that have adopted it as a policy. Some firms may even ask workers to take extra pay in lieu of vacations. Others who have shut down during the vacation period in recent years may revert to the staggered vacation schedule temporarily in order to keep pace with customer requirements. Still others are shortening the plant shutdown from two weeks to one.

Steel Picture

Throughout the metalworking field, with few exceptions, management is thinking in terms of a return to "normal" on the vacation front. There will be no wholesale waiving of vacations. Business is good but few companies are so hard pressed that vacation schedules will be dropped. Besides, most managers and union leaders recognize the importance of time off in terms of worker efficiency.

The bustling automotive industry seems to be taking the vacation problem in its stride. Auto-

motive plants will keep running but regular vacations will be the rule. Shutdowns for model changeovers are short-lived in relation to what they once were. So the automatic vacation is a thing of the past.

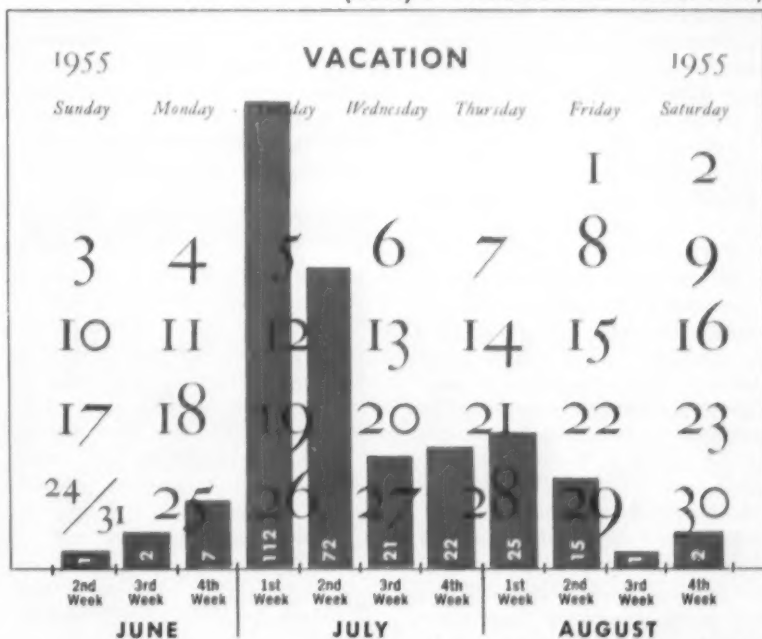
In steel, there is a mild interest in plant vacation shutdowns, but no definite trend. Non-integrated western mills adopted the two-week closing some years back, using the period for major maintenance and cleanup.

Larger integrated mills find shutdowns more of a problem, although many of them suspend op-

erations in some departments. This sort of thing is likely to be held to a minimum this year. For instance, Jones & Laughlin last year shut down some operations. But with business the way it is today, the company is delaying its decision and may ask workers to take extra pay and continue working.

At some Republic Steel operations, workers already have been offered the chance to work and collect vacation pay, too. Donora Works of American Steel & Wire Div. has definite shutdown periods. Hot metal operations of U. S. Steel

Trend in Plant Vacation Shutdowns
(Survey of Cleveland Area—No. of Firms)



Source: Associated Industries, Cleveland

SPECIAL REPORT

divisions in Cleveland will work through, but other departments will be shut down for a two-week vacation period.

Thomas Strip Div. of Pittsburgh Steel has had mill shutdowns in past years but plans to stagger vacations this year if operations continue at present high level. Much closer attention is planned for scheduling to permit uninterrupted production.

Foundry Outlook

One major plant abbreviating its plant shutdown this year is Thompson Products Co., Cleveland. A large producer of automotive and aircraft parts and electronics, the firm this year is shortening its plant closing from the regular two weeks to one, starting July 25, for the first time since Korea. Time of the shutdown is chosen by employees through their labor relations council.

Another heavy aircraft supplier, Cleveland Pneumatic Tool Co., builder of landing gears, plans a regular two-week shutdown.

In the foundry industry, the picture varies. High production foundries including automotive suppliers probably will delay their vacation decisions pending outcome of Detroit labor negotiations. They are busiest of the industry but July normally is beginning of their slack season.

Foundries supplying heavier castings are slow, and employment is off sharply. Many are operating at half capacity or less. Heavy cranemakers, too, are generally below capacity, minimizing the vacation problem. West coast foundries for years have had a two-week industry-wide vacation in summer.

Stampers Too Busy

In the appliance industry, now enjoying high output, there seems little inclination to work through the vacation period. General Electric's giant Appliance Park near Louisville plans to shut down this

year. Appliance and home furnishing suppliers also are planning shutdowns as usual.

Some firms, such as Mullins Mfg. Co., Warren, O., have been able to offset seasonal fluctuations through warehousing. Production is maintained on an even keel throughout the year and output stockpiled. Thus, vacation schedules are not dependent on the vagaries of product demand.

In the stamping industry, where rush shipments are the order of the day, plant shutdowns are virtually a competitive impossibility. The bulk of firms continue to stagger their vacation periods, according to the latest survey by Pressed Metal Institute.

Although welder production is in high gear at Lincoln Electric Co., this firm will shut down the last two weeks in July.

Shippers Headache

In some areas there is a trend toward the plant shutdown as opposed to staggered vacations. Last year in Cleveland, 67 companies closed for one week and 114 closed for two weeks, while 110 firms staggered vacations. But many of these same companies will switch back to staggered schedules in '55.

The plant shutdown is creating some unanticipated problems for shippers and carriers who oftentimes do not learn of closings until they attempt to make deliveries. Some business groups now serve as clearing houses for plant closing information, which is passed along to truckers, railroads, and suppliers.



"Please J. B., you're steaming my glasses."

Boom:

Income, jobs, orders join
broad U. S. upswing.

Heavy order volume, increased consumer incomes and expanded plant facilities are signs and causes of a definite business upswing for the spring.

Primary and fabricated metals companies are leading the way in expansion of new orders received by durable goods producers.

Government economists report a 5 pct rise in new business placed with durable goods manufacturers in February, compared with the seasonally-adjusted rate for January. In February these orders were valued at \$12.8 billion, while in the previous month their value was \$12.1 billion.

A lesser increase, 2 pct, was registered in the orders placed with producers of nondurables. These orders rose in value from \$12.7 billion in January to \$12.9 billion in February.

Build Backlogs

Manufacturers' sales of both durable and nondurable lines were up about 1 pct, with the transportation equipment group showing the only decline. Durable goods sales increased from \$12.3 billion in January to \$12.4 billion in February. Sales of nondurable items advanced from \$12.6 billion to \$12.8 billion.

Order backlogs of durable goods firms were valued at \$45.7 billion in February, up \$600 million from the previous month. Nondurable goods industries registered a February gain of \$100 million to a \$3 billion total.

New housing starts in the first 2 months of the year were at an adjusted rate of 1.4 million, equaling the 1950 peak.

Employment and income figures indicate the boom is on solid ground. A January consumer income rate of nearly \$291 billion permitted retail purchases 7 pct over the first 2 months of '54.

Non-farm employment is following an improved trend that began after mid-1954. February employment was 200,000 above the 51.5 million average of last spring.

DIVERSIFICATION: Republic Rides High

Broad lines enable company to maintain stable operations and move into rising markets . . . Current flat rolled demand keeps furnaces going full blast . . . Officials see new growth—By T. M. Rohan.

♦ PROBABLY the major corporate characteristic of Republic Steel Corp. on the 25th anniversary of its founding this week is its closeness to its customers.

An official last week candidly characterized the firm this way:

"Our fabricating divisions have used up to 18 pct of our tonnage in a single year and account for their full share of company profit. Our major expansion has been in flat rolled and light steel products in the widest possible diversity.

"Our profits remain good because we're closest to the customer dollar. The profits are higher there although unfortunately the fluctuations are more pronounced."

See New Growth

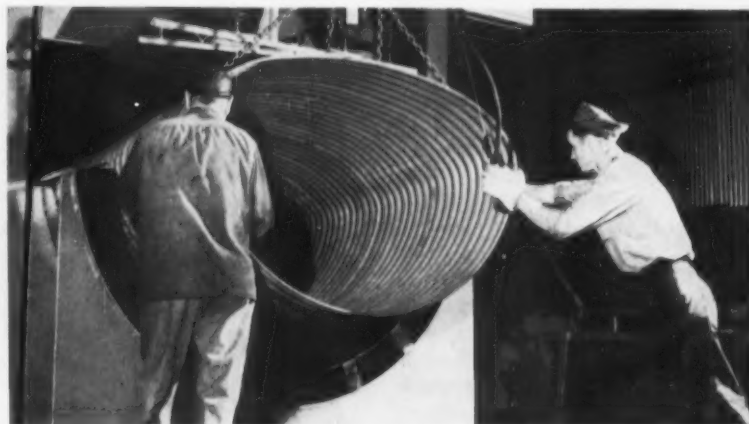
Although Republic currently has 10.2 million annual tons ingot capacity, at least another 3 million will be added in the next 25 years if Republic's growth keeps pace with the industry, according to Norman Foy, vice president in charge of sales.

Mr. Foy told THE IRON AGE:

"If Republic were merely to grow at the same rate as the industry over the next 25 years, it must build the equivalent of new plants the size of its present Chicago, Warren and Buffalo steel plants.

Flat-Rolled Will Grow

"The industry now has the capacity to provide each person in the United States with 530 lb of flat rolled products per year. On the basis of population growth alone, flat rolled production, an important factor in Republic, will rise 17 pct by 1965. Actually there will be continued growth in the use of flat rolled products at the expense of other products and



VARIETY of output means greater markets, stable operations. Corrugated metal pipe is here being shaped at Republic's Culvert Div.

so this increase of 17 pct is conservative."

Offer Many Lines

A good deal of Republic's expansion has come through poking its corporate nose into unusual corners.

Using its Adirondacks ores, only U. S. source, it says it's the sole U. S. producer in the steel industry of iron powder with a new plant in Toledo built for the purpose.

It also owns a plastic pipe manufacturing firm in Arkansas. It is in titanium melting and rolling.

This year it will start producing its own rutile ore from a rich Mexican deposit so at the moment, it lacks only reduction facilities to make it a completely integrated producer of titanium as well as steel. It is actively seeking a cheaper continuous reduction process.

The ore was turned up by a diligent 82 year old Republic mining consultant after being dismissed by at least three other U. S. mining exploration parties.

In keeping with the atomic age it recently added the former chief of the Atomic Energy Commission's Industrial and Reactors branch. Republic was one of the first to trace raw materials through radioactivity and is now tracing dispersion of alloy materials in steel furnaces.

Cleveland's Cyrus Eaton, company founder, built Republic into the third largest producer, a rank it still holds. Republic was conceived in Boston when Eaton on a trip there in 1929 read in a newspaper that a New York bank had backed out of refinancing Trumbull Steel Co. at Warren, O. Eaton's offer to buy the company was accepted.

In short order it was merged with the much larger Republic Iron and Steel Co. of Youngstown. Then with T. M. Girdler, former Jones & Laughlin president, slated to be board chairman, it merged in fast succession with Donner Steel Co. of Buffalo, Central Alloy Steel Co. of Canton, Massillon and Chicago, and Bourne-Fuller Co. of Cleveland.

AUTOWORKERS: What Price Strike?

UAW convention lays strike groundwork . . . \$25 million fund gives added strength . . . But Detroit strike talk eases as chance of compromise gains ground . . . Reuther still the whole boss—By T. L. Carry.

♦ **MILITANT** United Auto Workers, on the march toward a guaranteed annual wage, leave no doubt that they are ready to call a walk-out to get their demands, or at least a face saving compromise.

The 3100 delegates at the union's national convention in Cleveland last week wasted little time on official strike talk. They indicated, from top leadership on down, that they don't want the prolonged hardship of a strike of serious proportions. But the overall purpose of the convention laid the groundwork for that strike if negotiations don't result in some kind of a UAW victory.

Strike Talk Eases

Following the convention, strike talk in Detroit was less strong on both sides, partly as a result of these two theories:

A satisfactory settlement might be a substantial wage raise, with part of it set aside for an unemployment fund which would augment a laid-off worker's state unemployment compensation.

It looks more and more like Ford will be the battle ground. Ford is theoretically more eager to retain



REUTHER DEMONSTRATION: CIO-UAW delegates demonstrate in Cleveland as Reuther was nominated, later elected for sixth term.

its new leadership in the Ford-Chevrolet race. There may be some unhealed sores remaining from GM's pattern setting 5-year pact which Ford had to follow.

The approval of a \$25 million strike fund gives the union a huge psychological sledge hammer with which it will try to break down

the solid wall of resistance that has been built up by the auto companies to the guaranteed annual wage.

Approval of the fund came as no surprise. It seemed a foregone conclusion that a dues increase would be authorized. Opposition to the fund itself dwindled away shortly after a watered down version was offered for approval. The original proposal called for a \$5 dues increase beginning in May and effective until \$25 million was raised. Then the dues would drop back to \$2.50 a month until the strike fund dwindled to \$15 million. When the fund reached this point, membership dues again would have gone up to \$5 until the \$25 million figure was reached again.

Fund Use Argued

As passed, the resolution is the same as the original except that dues would be increased \$1 a month when the fund dwindled to the \$20 million point. Membership dues

Here's What Auto Workers Want:

▪ **A guaranteed annual wage based on a guaranteed 40-hour week.**

▪ **Wage increases of at least 10¢ per hour compounded by an increased annual improvement factor plus upward adjustments in the escalator formula.**

▪ **A limit of 2 years to future escalator contracts.**

▪ **Improved pensions increasing the company's contribution from**

\$1.75 a month to \$2.50 a month, both exclusive of Federal Old Age benefits.

▪ **An open-end maximum to pension payments, now limited to \$137.50 a month.**

▪ **Hospital benefits fully financed by the company, replacing present 50-50 contribution plan.**

▪ **Four weeks vacation for workers with 15 or more years of service.**

will then be \$3.50 until the fund is built back up to \$25 million.

An interesting and decided difference of opinion developed among the delegates as to how this \$25 million was to be distributed. The question of whether the money should be distributed to strikers on the basis of right or of need was debated up and down the convention hall for seven long hours. When the issue finally came to a vote, those on the side of need won an extremely close victory.

The outcome was somewhat less than satisfactory to some of the delegates. As one of them put it, "I work hard and save my money for a rainy day such as a strike. The guy who works next to me is a bum who never pays his bills and never has any money. So what happens when a strike comes along? He gets the money because he needs it. I get nothing because I have saved my money, but I think I got more right to a strike allowance than he has."

Ask AFL Help

One noteworthy suggestion was brought out during the strike fund debate by Carl Stellato, Reuther foe and President of the huge Ford Local 600. He suggested the CIO and the AFL raise a joint strike fund in the vicinity of \$100 million. Mr. Reuther contended he had been urging such cooperation between the unions the last ten years. He hinted he would look into the possibility of a joint defense fund more thoroughly after the UAW had solved the more immediate problem of new contracts. He predicted it would be done.

Machinery Takes Over

In this respect, the UAW leader seemed to have the tacit approval of George Meany, president of the AFL. He did not mention a strike fund in his speech to the convention, but he did give his moral support to the UAW's objectives of a guaranteed annual wage.

Any bitterness that was left from the outcome of the strike fund debate seemed to be completely washed away when the convention got down to the business of electing officers. Mr. Reuther and Emil Mazey, secretary-treasurer of the UAW, were unopposed in their bid

for re-election. The union's well-oiled election machinery was started up and it seemed as though it would only be a matter of time before the whole Reuther slate went into office.

The nominating speech for Mr. Reuther lasted five minutes. This was followed by a rather synthetic demonstration on the part of the delegates that lasted 25 minutes. Re-election was by acclamation. The same, but briefer, procedure was followed for Mr. Mazey.

The election machinery was strained somewhat when two outsiders, Nat Turner from Flint's Buick Local and Carl Stellato, were nominated for vice-presidents in opposition to the four men who were on Mr. Reuther's slate of candidates. Any doubts as to the outcome of the election were swiftly removed after a 6-hour roll call vote. The president's choices for the vice presidents, Richard Gosser, John Livingston, Leonard Woodcock and Norman Mathews, all won overwhelming victories.

Solidarity was the theme of the convention. And although some signs of discontent popped up intermittently, these were quickly smoothed over. The delegates left united with a single objective: the guaranteed annual wage.

See Spring Job Gains

Further moderate increase in employment, spurred by rising hirings in manufacturing, are anticipated this spring by the U. S. Labor Dept. All but 16 of 149 major industrial centers surveyed by the government expect to share in the increase.

The survey shows that auto and steel industries, which registered substantial gains in employment this winter, will continue to set the pace for the spring hiring up-trend. Increases are also scheduled in the electrical machinery, aircraft, farm machinery and furniture industries, and in plants making major household appliances.

Republic Wages

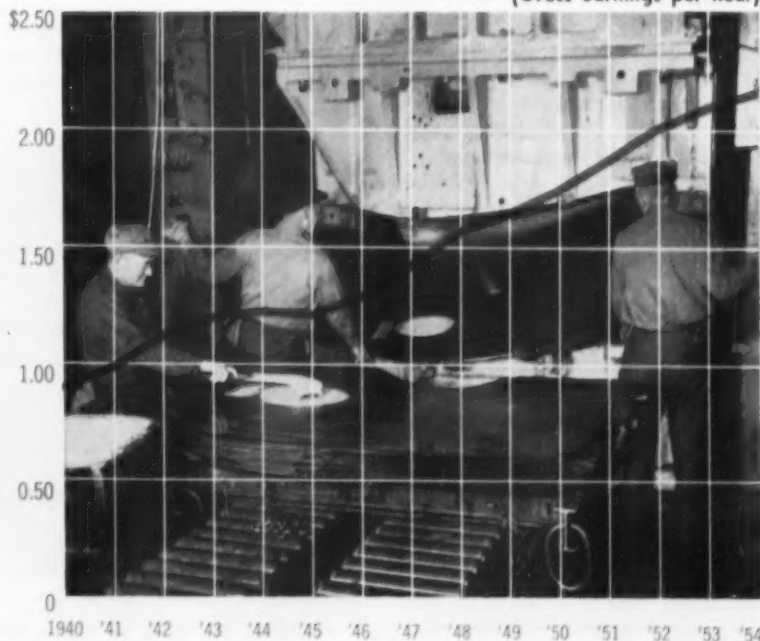
Employment costs for 58,000 employees of Republic Steel Corp. and subsidiaries exceeded \$300 million in 1954, the company's twenty-fifth year of operations.

This is nearly six times the employment costs of Republic and subsidiaries during its first year of operations a quarter-century ago.

Included are wages and salaries, pensions, social security and hospitalization.

Autoworkers' Wages Are Rising

(Gross earnings per hour)



KRUPP: His Interests Are World-Wide

Once convicted as a war criminal, munitions heir makes comeback in world markets . . . Looks to South America, Asia, Near East for markets and areas of expansion . . . Revival a European enigma—By H. Gifford, Jr.

♦ TEN YEARS ago Alfred Krupp and his great German industrial cartel were at the depths of international ruin and disgrace. Today the same team has regained prominence nearly equal to that enjoyed in its best prewar years.

Krupp's factories at present are manufacturing machine tools, locomotives, trucks, tractors, containers, agricultural machinery, dies, electric machinery and such consumer goods as radio and TV sets.

From the heart of his industrial empire in Essen, the 46-year-old heir to the giant cartel has disclosed that his company has regained a firm hold on world trade and is expanding on a global scale.

The industrialist who gained his fame, or notoriety, as a munitions maker, today claims that he will not produce munitions again unless compelled to do so. He is not allowed to produce coal and steel inside Germany and must get rid of his mines in the Ruhr before 1960.

But even a forced sale should increase his fortune by \$50 million. His present properties are valued at \$95 million. In addition, there is nothing stipulating that he cannot produce coal and steel in any other part of the world and there is mounting evidence pointing to Krupp's expanding outside of Germany itself.

Once Appeared Ruined

How did he stage this great comeback and what does it mean to Europe as a whole?

In 1945 Krupp was charged with war crimes, later convicted and sentenced to serve 12 years in prison. All his properties were ordered confiscated and dismantled. Allied reparations erased 40 pct of his giant Essen works. His Kiel shipyard was ordered dismantled.



SHADOW of gallows was cast on Alfred Krupp's face as he left prison and began rebuilding an empire.

Russia got 130,000 tons of machinery and Great Britain 150,000 tons of scrap. His empire was ordered broken up and decartelized.

In 1951 Krupp was released from jail by a controversial American edict. His apologists contend he had no choice other than to make the materials of war under Hitler's orders. Others claim that Krupp had complicity in using slave labor.

Nevertheless, he immediately set about regaining control of his empire.

After 2 years of legal proceedings, Krupp was asked to prepare a plan for reorganization of his properties. It was finally agreed that if Krupp should sell his coal, iron and steel holdings by 1960, the remaining Allied controls would be lifted.

Probably the most plausible ex-

planation for the action taken on Krupp was one of expediency. The Soviet Union had decided on a policy that it hoped would keep a demoralized and discontented Germany as a constant economic drain on the West. It would also work as propaganda tool to turn Germany toward Communism.

Traditional Markets

Therefore, it is not surprising that the Allies allowed the resurrection of German industry under the leaders who best knew German methods and German workers. This allowed West Germany to bolster its own economy, thus pacifying discontent among German workers and lessening the economic drain on the western powers.

Meanwhile, Krupp has turned his attention outside of Germany. He has proposed a locomotive factory in Brazil and it was reported Krupp intended to invest \$50 million in that country. It was also hinted that Spanish munitions industry was to be built up under Krupp direction. One of his executives went to Greece to study the quality of nickel in mines there—and a year later it was reported that Krupp was constructing a nickel processing plant and was planning to build a nitrogen fertilizer plant there.

However, the major area where Krupp has expanded his interests is the former favorite trade ground of Germany, the Near and Middle East. There is reason to believe that Krupp machinery and vehicles are being sent to Turkey. In Egypt, Krupp was purportedly a bidder for equipment contracts for iron ore deposit exploitation.

Author H. W. Gifford, Jr., was until recently a writer and analyst of European politics and economics for Radio Free Europe.

INDIA: Plans Big Steel Buildup

Program aimed at 1.8 million tons annually by 1957 . . . Should hit over 11 million tons by 1967 . . . Plan 3 new million-ton plants, updating of present facilities . . . Russia among foreign developers.

◆ **INDIAN PLANS** for stepping up steel output within the next 10 years are well underway.

The Govt. Planning Commission's first 5-year plan has targeted annual steel production at 1,848,000 tons by 1957-58.

Under a second 5-year plan already formulated, ingot production should reach 6,720,000 tons by 1962. A third 5-year plan has set production sights at more than 11 million tons by 1967.

Implementing the drive to up steel output are recent foreign negotiations for 3 new million-ton plants and current expansion and modernization of existing facilities.

The Commission's plans for the step-by-step buildup are given impetus by: (1) good amounts of high Fe ore deposits situated near coking coal supplies; (2) imbalance of pig-iron output over steel production; (3) serious delays in the nation's industrial development caused by an acute shortage of steel.

Recent foreign negotiations have resulted in new plant construction

agreements being reached with West Germany, with additional Russian and British overtures "accepted in principle" by the government.

The German agreement, signed with Krupp-Demag at Bonn in 1953, calls for construction of a new State plant having an estimated annual ingot output of 1,120,000 tons within 4 years. Contracts will not necessarily go to Germany, but will depend on what offers are received from other countries.

The Hindustan Steel Co. has been formed to implement the agreement. Total capital cost of the project is an estimated \$150 million with Krupp loaning about \$20 million.

The balance will be supplied by the Govt.

Russia has recently signed an agreement to build a plant with an annual capacity of 1,120,000 tons. This is, however, subject to ratification.

Estimated cost of the project is \$210 million including site development and the building of a town.

Russia will supply about \$92 million of plant, machinery and equipment, excluding a sintering plant, all f.o.b. Black Sea or Baltic ports. The amount is repayable in 12 annual installments at 2½ pct interest.

If the agreement goes through, the plant will be controlled entirely by the government. It will be the first major project of its kind outside the Communist Bloc to be financially aided and constructed by the Russians.

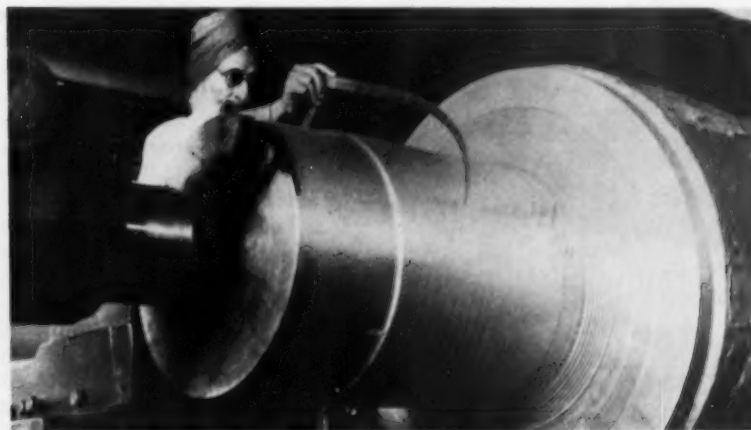
Capital a Problem

Indian insistence on predominant State ownership of new plants recently led to negotiation failure between Britain's Metallurgical Equipment Export Co. and Indian industrialists. Proposals were later submitted indicating that the British Govt. would make available long-term financial aid for state-controlled plants exactly as it would for privately-owned enterprise.

Lack of capital and a supply of new equipment has slowed home plant expansion and development. India's 1948 announcement that it plans eventually to nationalize iron and steel added to already existing difficulties in developing capital from home and overseas markets.

Another difficulty has been to find plant manufacturers who were in a position to supply new equipment and modernize older plants. This picture has now changed since the government has found new capital and plant manufacturers are competing in a tightening market.

Amalgamation of the Steel Corp. of Bengal with Indian Iron & Steel Co. in 1953 through Govt. pressure was an important step toward increased home production efficiency, and indicates the determination behind expansion.



INDIAN worker measures the roll neck in roll turning operation and shows how a nation of traditional farmers is now producing skilled machinists.

EQUIPMENT: Juice Up Electrical Sales

Industrial recovery stirs demand for heavy electrical equipment . . . Producers look for 15-20 pct gain in '55 over '54 . . . Pickup follows early cutrate sales . . . Utilities industry buying more—By K. W. Bennett.

♦ **INDUSTRIAL RECOVERY** is catching up with the heavy electrical equipment industry. Producers look for a 15-20 pct advance in '55 over '54.

Apparently, the surge in new business was unexpected. As late as February, producers were selling at cutrate prices. Today, it's hard to find any one who can give a reasonable explanation for these so-called "white sales."

The big question mark now is how much of current bookings was crammed into this bargain-basement period. A major producer says he booked more business from utilities in first two months of 1955 than in the entire year of '54.

But the recovery is genuine. The "white sales" are over but the new order rate continues to mount. Behind the upturn are these factors:

Electric power consumption has skyrocketed during the last 30 days. Two weeks ago, electrical output hit 9.1 billion kw hrs, a 16.7 pct gain over the like period of 1954, and the best weekly gain this year.

Utilities Catching Up

Both utilities and industry are buying again. One manufacturer reports a 20 pct gain on heavy motor sales over the year-ago period; another's motor line is up 30 pct; new order rate is holding firm. A producer of heavy electrical equipment says his sales to utilities are up 20 pct, and better than that to manufacturers.

Utilities are trying to make up for what they didn't buy in 1954. With their own sales up, automotive, chemical, steel, and other ma-

jor consuming industries are back in the market for power equipment to maintain higher production schedules and to replace existing apparatus.

Besides actual gains in heavy equipment, wiring and apparatus manufacturers have a strong potential market. James Jewell, Westinghouse vice-president, forecasts a \$12 billion market in residential wiring and apparatus for residential use in the next 5 years.

Philip Sporn, American Gas & Electric president, believes that the 80 air conditioning manufacturers are currently producing \$2 billion of equipment annually and will hit \$5 billion by 1965. The summer air conditioning load, already a headache to most utilities and scheduled to get worse, seems to be a transmission rather than a generating problem, however.

Prospects Bright

Beginning in late January and carrying well through February, heavy electrical equipment, chiefly generating equipment, was available at discounts that ranged as high as 40 or even 50 pct. Ask any single producer why and he comments, "Well, I had to stay competitive." Even to the industry it's not clear why prices were cut.

But as the white sale period died, the new order rate did not. With an unexpectedly high demand for both current and equipment from heavy power and light users, which take about half of the total power generated annually, the prospect is brightening.

Since end of World War II, total consumption of electrical energy has been advancing by about 8.3 pct per year from 1945-1950, and about 10.4 pct since 1950. The advance this year has run 14 pct ahead of a year ago.



GIANT electrical assembly floats through the air in the first leg of its trip from Westinghouse to Ohio atomic power plant.

ENERGY: Atoms Are Going To Work

Utilities have big plans for nuclear power and big budgets to match . . . Reactors are under way in three areas of the country . . . Power engineers also see greater use of industrial TV, radar.

♦ **NUCLEAR POWER**, which has been playing to increasing audiences every year at the annual Power Engineer's Conference at Chicago, packed a hotel ballroom to the eaves last week. This year, however, the discussions were not theoretical. Utilities men were outlining plans already underway for nuclear produced electricity.

A. S. Griswald, Detroit Edison, reported a program already formulated by Atomic Power Development Associates, an organization representing 25 utilities, four engineering firms and three industrial firms. Two weeks ago a corporation, representing the member firms, was set up that will spend several millions on further development work. It is prepared to lay out \$5 million of an estimated \$45 million total for the building of a 100,000 kw plant if other groups will put up the remainder. The primary plant will be erected at an estimated cost of \$450 per kw, will probably be in operation within five years, and operating economically in ten.

Build Reactors

Philip Sporn, speaking for the Nuclear Power Group, representing five major utilities, announced that the group has abandoned plans for a proposed heavy water reactor, and is now considering a boiling water reactor, spending about \$400,000 per year on research.

William Webster, executive vice-president of New England Electric System and president of Yankee Atomic Electric Company, a group of 12 utilities, said the group had filed with the AEC last week to build a 100,000 kw reactor, and it is expected the cost will go to \$25 million or \$250 per kw. Surveys for this plant are well along.

Vice-president James Fairman of Consolidated Edison, reported

acceptance of a Babcock and Wilcox proposal for a reactor to generate 235,000 kw at a \$230 per kw initial cost. Initial operating cost for this plant will be 9 mills per kwhr.

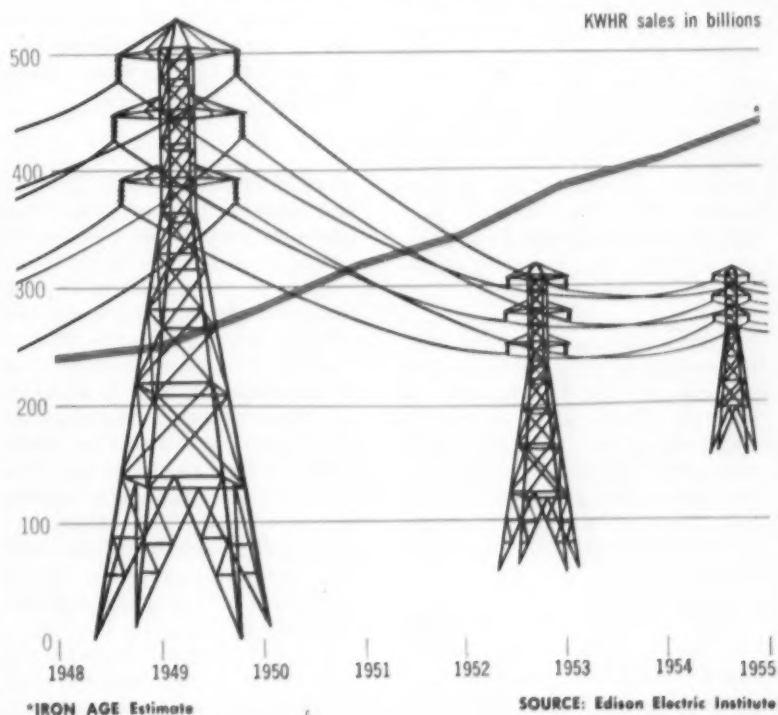
Mr. Sporn believes that there are about 21 groups studying atomic power at present, with the idea of adapting it to production of electric power rather than use of the reactor to produce radioactive materials for military, industrial, or medical use.

Power engineers were seeing more than nuclear power in the immediate industrial outlook. Industrial television, for instance, it was reported, is now being used by automotive, glass, steel, railroad, department store, and hotels for

every job from spotting the potential shop-lifter to viewing the handling of radioactive or superheated materials at close range. Said R. H. Johnston, General Precision Laboratory, industrial TV is a coming thing.

Commonwealth Edison, at Chicago, reported using a radar effect to locate faults in buried or overhead power lines. A pulse of energy is sent over the line or cable and a portion of the energy is reflected, by an impedance discontinuity back to the receiver where it is detected. The transmitted and received pulses are displayed on a cathode ray tube and a ranging device is provided to measure the time interval between the transmitted and received pulse.

Electricity Demand Is Soaring



MERGERS No Big Changes Coming

Justice Dept.'s study of antitrust laws indicates existing laws are adequate if properly administered . . . Subcommittee makes 60 suggestions for administrative action . . . No change in '55—By N. R. Regeimbal.

♦ **JUSTICE DEPT.'S** discussion of the good and bad points of existing antitrust laws and their administration, as well as a soon-to-be published study of the current "wave of mergers," are, or should be, favorite reading for business executives, corporation lawyers and judges in the months ahead.

Exact weight that the Administration will give to the Justice Dept. committee's report in determining what new legislative or administrative changes are needed, has not yet been decided. But Stanley N. Barnes, Asst. Attorney General for Antitrust and one of two co-chairmen of the committee, is drafting legislation based on some of the 10 specific recommendations for legislation made by the committee.

Want Tougher Policy

Among the legislative recommendations is one to give the Attorney General power in civil antitrust cases to serve an "investigative demand," which would require corporations to produce existing correspondence and other business records, before a complaint is filed. For the most part, the other recommendations affecting industry would correct unreasonable or inconsistent provisions of the law.

Some sections of the report urge more stringent antitrust policy, but contain no recommendations for legislation. In all, there are 60 recommendations for administrative action in the study, indicating that the committee believes existing laws, if properly administered, are strong enough to control the "urge to merge."

Increase Fines

In its discussions of labor unions under the antitrust laws, the committee considered only the effects

Says They're

Four-Time Losers . . .

Rep. Wright Patman, D., Tex., fiery co-sponsor of one of the major sections of the antitrust law, is calling for a congressional investigation of the Attorney General's special subcommittee which recently completed a study of the antimonopoly statutes.

The Texan charges the 60-member committee is a super lobby trying to emasculate the antitrust laws by replacing "all rule of law" with a rule of reason. The committee, he says, is "a grand assembly of big corporation lawyers who are four-time losers in antitrust prosecutions, with a few college professors and other citizens sprinkled in for decoration."

of union activity affecting products and markets, shying away from any position on the powers the unions wield in other areas.

Cases in which markets or products are affected, the committee says, are already covered by antitrust laws in some instances, and where they are not it suggests legislation to cover "only specific union activities" aimed at direct control of the market through coercive action. But the committee cautioned that such legislation should be drafted with "greatest care (toward) protecting labor's full freedom of association and self-organization."

One of the general recommendations in the report, that antitrust fines be increased, has already

passed the House. But while the committee recommended the present fine of \$5000 be doubled, the bill now moving through the Senate would increase fines to \$50,000.

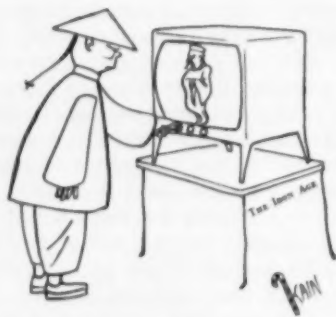
While it is probable that none of the committee's major recommendations will go through Congress this year, the Justice Dept. report, backed by the FTC analysis of mergers, will have a good head of steam by next year. And the arguments made in the two studies will bear on court cases.

Study Atomic Power

Atomic Energy Commission has approved two studies of nuclear power production.

Construction Engineering, Inc., New York, will make a design and evaluation study of large reactors for central-station power output and of small reactors for special jobs.

Fairbanks Morse Co., Chicago, will assist Seminole Electric Cooperative, Inc., Madison, Fla., in a one year study to determine if an atomic power plant will produce electricity at less than high costs prevailing in the Florida area.



"Yes, Master?"



SNUG FIT: Corrugated iron "pod" of UAL San Francisco hangar permits housing of (2) 109-ft Mainliners in structure only 200 ft long.

Maintenance:

Stretch hangar to provide home for big planes.

Yankee ingenuity and a little squeezing have solved a housing problem for United Airlines at their San Francisco maintenance base. Trick was to get two 109 ft DC-7s into a hangar 200 ft long. United's solution may give the Air Force a tip on how to put bigger bombers in smaller hangars.

United built 4 ft extensions at the end doors of the hangar. By dove-tailing plane noses and running the tail cones into the projecting sections, two DC-7s are fitted nicely into the hangar.

The extension sections consist of steel frames covered with corrugated iron. They are about 24 ft high, weigh 1400 lb each. Michel & Pfeffer Iron Works of South San Francisco did the building. The converted war surplus hangar had formerly been used for B-29's.

Markets Bomb Shelter

Hydrogen bomb concern has put at least one company into the bomb shelter business.

Survival Shelters, Inc., Madison, Wis., is marketing the first models of a shelter that will protect a family of six or 16 school children. Fabricated by the Brainard Div. of Sharon Steel Corp., the shelter will sell at \$149.50 f.o.b. Warren, Ohio.

It can be erected by a woman or teen-ager in about three minutes. It is the only shelter thus far approved by the Federal Civil Defense Administration for inclusion in the current series of atomic bomb tests.

On the way are other similar

shelters that will handle as many as 40 school children and can be dismantled and stacked easily after a false alarm. Survival Shelters is receiving about a dozen inquiries daily for franchise information only. It's reported that the FCDA receives thousands of letters each month requesting information on an approved survival shelter.

Stops Suicide Planes

Sudden death anti-aircraft guns for the Navy are now being shipped by Westinghouse Electric from their Sunnyvale, Calif., plant.

Product of Stanford University and Westinghouse development,

DEFENSE

the new 3-in. weapon has fast, automatic firing, is designed to stop suicide and other air attacks on Navy shipping. Successful firing tests were conducted at the Naval Proving Grounds, Dahlgren, Va.

The contract, valued at \$33 million, was placed by the Navy's Bureau of Ordnance.

Plane Becomes Radar Lab

Navy scientists are preparing to use a four-engine, specially-equipped airplane to make detailed studies of the target properties of single objects or extensive areas which reflect radar probes.

The flying laboratory, carrying four radar sets in nacelles below the wing, will also be used in experiments with radio wave propagation, possibly as one terminal of a one-way radio transmission line.

Appearance of the R5D aircraft was changed materially by the addition of a 15-ft mast midway along the fuselage. This device, which may be raised and lowered in flight, houses instruments for meteorological observations.

In the cabin are four radar consoles, plus control equipment, and high-speed movie cameras for recording data. The plane will accommodate up to eight scientists, in addition to the normal crew of three airmen.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Battery, dry BA-30, 4200000 ea. \$273,000, Bright Star Industries, Clinton, N. J.
Electron tubes, 65961 ea. \$343,494, Sylva Electric Prods., Inc., N. Y.
Tank, flame thrower, 17, \$1,204,739, Chrysler Corp., Detroit 31, Mich.
Fuse, grenade, 1000000, \$269,000, Bayshore Industries, Inc., Elkton, Md.
Tractors and parts, 16 ea. \$325,599, Caterpillar Tractor, Peoria, Ill.
Trucks, 2 1/2 T, 464, \$3,221,728, Reo Motors, Inc., Lansing 20, Mich.
Fuse, 780576, \$1,081,097, Monarch Governor Co., Detroit 6, Mich.
Parts pump, 7530, \$296,638, Buffalo Pumps, Inc., Buffalo.
Controls, various, \$436,861, Westinghouse Electric Corp., Phila., Pa., W. C. Wilson.
Pumps, various, \$252,236, Vickers, Inc., Detroit 32, Mich., *R. M. McCabe.*
Panels and generators, various, \$278,761, Bendix Aviation Corp., Eatontown, N. J.
Windlass, electro-hydraulic, 2 sets, \$280,494, C. H. Wheeler Mfg. Co., Phila. Pa.

EXPANSION IN INDUSTRY

Research: New Coast facilities for resistance welders.



SEAM WELDER dual arms provide for transverse, longitudinal welding.

Sciaky Bros. Inc., manufacturers of electric resistance welders, has opened a new Research Div. in West Los Angeles.

The 15,000 sq ft installation, powered by a 3000 KVA high voltage bank transformer, is designed to meet increased aircraft and electronic research and development programs on the West Coast.

Provision has been made for laboratories, testing machines, metal preparation, a machine shop and welding machines.

Activities will be geared to meeting specific resistance welding problems for industrial users and basic research into the resistance welding process.

Basic studies will include the behavior of various metals at ultrasonic speeds and attendant thermal conditions.

The program will also provide industry with technical information through reports in addition to specialized library facilities.

Welding machinery includes a 3-phase seam welder with dual arms for longitudinal and circular welding. Pressure is available to 10,200 lb and secondary amperes to 150,000. Welding capacity is from 1/4-in. total thickness in aluminum alloys to 1/2-in. total thickness in mild steel.

New Plant to Come

Chemicals Div. of Kaiser Aluminum & Chemical Corp. has taken option on 160 acres at Columbiana, Ohio, for its new \$4 million basic refractory brick plant.

Plant construction will begin in about 60 days. Operations are slated to get underway late this year.

Production will be concentrated on basic brick for the steel, glass, cement and copper industries. It will be divided between the high magnesia periclase, periclase-chrome and chrome-periclase types.

The periclase will be supplied from the company's raw materials plants in California. Chrome ore will be imported.

Utility Needs Grow

Improvements in water and sewerage lines costing \$25 billion over the next 10 years are needed to meet requirements of rapidly expanding urban and suburban areas, the U. S. Commerce Dept. says.

Based on 1954 costs, some \$10 billion in construction is needed to take care of the backlog, \$15 billion for replacements and expansion. This would mean an annual outlay of \$2 1/2 billion, compared with recent expenditures at an annual rate of a little more than \$1 billion.

Officials of the department's Business and Defense Services Admin-

istration, after surveying 552 major public water and sewerage systems which serve 75 pct of the population, warn that failure to meet these needs may bring increasing water shortages, restrictions on water use, and stream pollution.

Open Brass Plant

Plume and Atwood Mfg. Co., makers of brass and other metal products, have opened a \$1.5 million plant at Thomaston, Conn.

Replacing a multi-floor structure in Waterbury, Conn., the new ground level building will house fabricating facilities and office personnel. It is designed to strengthen the company's competitive position by permitting low cost manufacture and rapid delivery of an expanding product line.

Asks to Sell Stock

Eastern Stainless Steel Corp., Colgate, Md., is seeking Securities & Exchange Commission approval to sell 126,755 shares of its \$5 par common stock.

Part of the proceeds will be used to build additional melting capacity through installation of an electric arc furnace including melting department accessories and slab conversion equipment.

Estimated cost is about \$600,000.

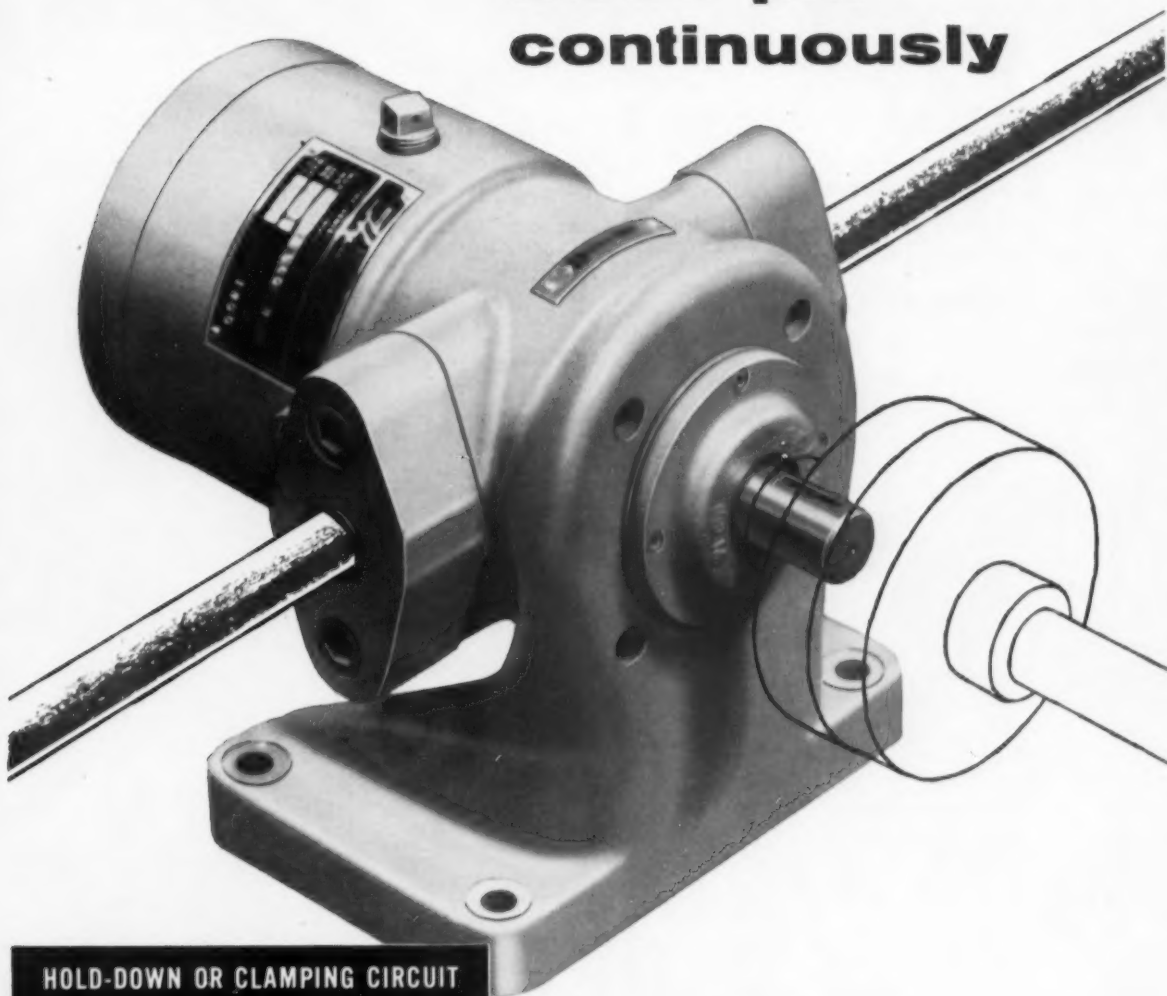
Remainder of the funds acquired by the sale will be allocated to working capital for the melting shop, to increase semifinished inventories and to retire outstanding bank loans.

Add Coast Facility

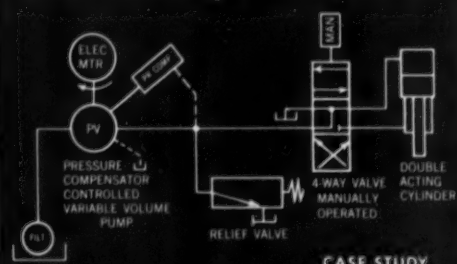
American Brass Co. will shortly begin construction of a \$13 million, 300,000 sq ft brass mill in Los Angeles County.

The new installation will produce copper and copper-base alloys, including sheet, strip, rod and tube products.

5000 psi— continuously



HOLD-DOWN OR CLAMPING CIRCUIT



**Denison Axial Piston Pumps
operate continuously at 5000 psi,
deliver up to 35 gallons per minute**

Few hydraulic pumps can operate at 5000 psi. And, if they can, it's for only a few seconds at 5000 psi. Not so with Denison Axial Piston Pumps. They deliver up to 35 gpm at 5000 psi . . . continuously. Yet they cost no more than many pumps with lower pressure ratings.

Three sizes deliver 10, 20 and 35 gpm. Available in constant or variable volume types . . . with handwheel, pressure-compensating, stem or cylinder volume controls. Mountings: Face, flange or foot.

The circuit shows a Denison Axial Piston Pump in a hold-down or clamping circuit. Write us for bulletins about Denison pumps.

DENISON

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**THE
DENISON ENGINEERING COMPANY**
1242 Dublin Road • Columbus 16, Ohio

April 7, 1955

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DATA COVER OPERATIONS OF 29 COMPANIES REPRESENTING 93 PCT OF THE INGOT CAPACITY OF THE UNITED STATES AS OF JAN. 1, 1954

COMPANY	Year	Ingot Capacity Net Tons	Ingot Production Net Tons	Percent of Capacity Operated	Steel Shipments Net Tons	Net Sales and Operating Revenue	Provision for Federal Income Taxes	Net Income	Net Income Percent of Sales	Number of Common Shares Outstanding	Earnings Per Common Share	Common Dividends Declared
U. S. Steel Corp.	1954	38,715,000	28,355,000	73.2	20,239,000	\$3,250,369,279	\$190,000,000	\$195,417,611	6.0	26,391,022 ¹	\$6.46	\$85,517,366
	1953	36,399,000	35,827,000	98.4	25,091,000	3,861,034,728	323,000,000	222,087,840	5.8	26,109,756	7.54	78,329,268
Bethlehem Steel Corp.	1954	18,500,000	13,810,076	74.6	10,226,732	1,667,377,179	119,000,000	132,837,154	8.0	9,582,942	13.18	55,101,916
	1953	17,600,000	17,662,687	100.4	12,712,994	2,094,952,155	161,000,000	133,947,837	6.4	9,582,942	13.30	38,331,768
Republic Steel Corp.	1954	10,262,000	6,972,812	69.8	5,012,330	846,310,670	49,900,000	52,875,164	6.2	7,325,956	7.10	28,940,731
	1953	10,262,000	9,630,454	94.5	7,135,745	1,137,123,547	100,500,000	56,743,547	5.0	5,952,919	9.25	26,652,970
Jones & Laughlin Steel Corp.	1954	6,166,500	4,570,000	74.0	3,203,000	492,941,000	22,543,000	25,032,000	5.1	6,196,554	3.80	12,396,000
	1953	6,166,500	6,033,000	96.0	4,278,000	624,387,000	27,900,000	31,015,000	5.0	6,200,654	4.77	12,091,000
National Steel Corp.	1954	6,000,000	.....	.....	.....	484,058,380	27,750,000	30,334,871	6.3	7,362,045	4.12	22,009,698
	1953	5,650,000	.....	.....	.....	634,178,060	69,325,000	49,174,080	7.8	7,362,045	6.68	23,862,229
Youngstown Sheet & Tube Co.	1954	5,520,000	3,868,525	70.1	2,606,540	433,406,272	12,104,000	20,182,500	4.7	3,353,546	6.02	12,566,618
	1953	4,947,500	5,091,876	102.9	3,675,229	554,059,088	27,900,000	30,839,716	5.6	3,350,016	9.21	12,562,560
Armco Steel Corp.	1954	4,902,000	4,448,772	90.8	3,171,401	532,045,314	42,522,317	41,100,266	7.7	5,229,574	7.86	15,645,892
	1953	4,718,000	4,704,773	99.7	3,375,630	588,919,900	50,788,608	33,902,462	5.8	5,214,988	6.50	15,640,891
Inland Steel Co.	1954	4,700,000	4,522,257	96.2	3,392,659	537,024,479	37,930,000	41,287,152	7.7	5,215,967	7.92	18,942,069
	1953	4,500,000	4,513,076	100.3	3,707,750	578,610,625	39,379,000	33,867,184	5.9	4,907,654	6.90	17,158,196
Colorado Fuel & Iron Corp. ¹²	1954	2,469,035	1,845,693	74.8	1,687,950	250,235,696	6,125,000	7,051,729	2.8	2,603,462	2.46	1,858,420
	1953	2,311,785	2,130,451	92.2	1,948,414	248,835,574	14,572,400	8,031,224	3.2	2,478,084	3.09	3,476,791
Wheeling Steel Corp.	1954	2,130,000	1,589,643	74.6	.....	190,224,955	8,483,000	9,595,740	5.0	1,425,173	5.48	4,272,175
	1953	1,860,000	1,797,419	96.6	.....	219,509,774	14,036,000	12,458,311	5.7	1,423,897	7.49	4,271,691
Kaiser Steel Corp. ¹³	1954	1,536,000	1,382,877	90.0	933,843	128,491,032	3,325,000	7,926,666	6.2	3,200,000	1.75	1,599,854
	1953	1,536,000	1,458,904	100.1	951,897	134,500,041	9,700,000	9,121,284	6.8	3,200,000	2.12	1,600,000
Sharon Steel Corp.	1954	1,550,000	846,515	54.6	611,668	99,347,910	1,865,000	3,134,864	3.2	1,100,000	2.85	2,750,000
	1953	1,550,000	1,527,706	98.6	1,144,488	168,268,508	7,240,000	6,709,625	4.0	1,100,000	6.10	4,400,000
Crucible Steel Co. of America	1954	1,351,400	.....	.....	.....	160,621,738	4,398,000	3,705,952	2.3	821,784	2.83	8% stk. div.
	1953	1,351,400	.....	.....	.....	232,276,349	6,896,979	5,109,802	2.2	687,180	5.28	8% stk. div.
Pittsburgh Steel Co.	1954	1,320,000	1,070,386	76.2	784,420	124,489,418	973,000	2,170,694	1.8	1,386,644	.62	8% stk. div.
	1953	1,404,000	1,037,335	86.4	1,009,511	141,471,302	5,520,000	4,648,195	3.3	1,281,208	2.61	8% stk. div.
Granite City Steel Co.	1954	1,080,000	634,909	58.8	559,112	69,265,197	4,400,700	4,012,192	5.8	1,640,409 ⁴	2.04	1,846,233 ⁵
	1953	720,000	937,801	130.3	805,455	87,856,006	6,953,500	6,488,452	7.4	1,544,044 ⁴	3.77	2,945,227 ⁵
McLouth Steel Corp.	1954	960,000	434,320	56.4	368,667	.....	2,090,000	1,694,890	.....	1,189,600	1.42	None
	1953	579,700	528,733	91.2	631,684	.....	11,560,000	5,241,501	.....	1,189,600	4.41	None
Barium Steel Corp.	1954	893,000	237,000	26.5	.....	53,484,604	1,772,500	441,212	0.8	3,082,737	.14	1,521,240
	1953	893,000	497,790	55.7	.....	89,719,175	3,849,840	2,321,140	2.6	2,299,859	1.01	1,144,957
Allegheny Ludlum Steel Corp.	1954	864,200	431,068	49.9	305,208	170,056,405	4,459,000	4,246,083	2.5	1,689,360	2.30	3,378,719
	1953	864,200	680,619	78.8	537,341	242,091,546	11,670,000	7,791,287	3.2	1,689,358	4.40	3,312,466 ⁶
Northwestern Steel & Wire Co. ¹⁷	1954	825,000	308,780	37.4	246,170	35,628,171	1,065,000	1,018,754	2.9	817,825	1.25	None
	1953	825,000	440,503	53.4	336,056	44,317,283 ¹	640,000	438,163	1.0	817,825	.54	None
Newport Steel Corp. ¹⁸	1954	708,537	154,658	29.0	119,238	18,371,670	255,000	62,012	0.3	1,065,491	.06	213,098
	1953	708,537	528,024	75.0	388,798	55,970,138	1,899,344	2,523,384	4.5	1,078,546	2.34	539,273
Lukens Steel Co.	1954	675,000	631,834	93.6	455,153	74,954,710	2,065,000	2,014,791	2.7	317,976	6.33	1,112,916
	1953	675,000	763,879	113.2	590,635	97,850,937	9,325,000	3,607,713	3.7	317,976	11.35	953,928
Detroit Steel Corp.	1954	660,000	442,753	67.1	371,081	51,688,448	71,338	1,182,528	2.3	2,419,017	.49	.....
	1953	660,000	529,000	80.2	583,421	93,391,509	6,612,624	5,230,259	5.6	2,419,017	2.16	1,778,690
Alan Wood Steel Co.	1954	625,000	345,918	55.3	241,288	36,085,476	216,000	1,246,251	3.4	656,053	1.42	218,684
	1953	625,000	598,334	95.7	442,537	59,756,645	2,457,000	3,213,690	5.4	624,812	4.63	859,685
Copperweld Steel Co.	1954	618,380	.....	.....	.....	49,694,295	520,000	927,065	1.9	515,188	1.32	927,339
	1953	618,380	.....	.....	.....	83,803,418	3,120,000	2,852,078	3.4	515,188	5.05	1,030,270
Lone Star Steel Co.	1954	550,000	379,009	69.0	184,497	37,208,044	.....	1,008,778	2.7	2,640,000	.38	.....
	1953	550,000	195,155	.....	124,849	27,284,256	338,600	2,113,568	7.8	2,640,000	.80	.....
Laclede Steel Co.	1954	500,000	396,023	79.2	311,140	45,364,073	3,050,000	2,943,150	6.5	206,250	14.27	1,320,000
	1953	440,000	427,514	97.2	362,040	50,834,319	4,975,000	2,703,805	5.3	206,250	13.11	1,072,500
Keystone Steel & Wire Co.	1954	425,000	334,444	78.7	275,229	49,332,276	6,981,536	6,114,772	12.4	1,875,000	3.26	3,000,000
	1953	425,000	346,969	84.0	268,799	44,554,153	4,861,627	4,149,946	9.3	1,875,000	2.21	3,000,000
Rotary Electric Steel Co.	1954	425,000	172,916	40.7	117,165	31,643,658	1,938,000	1,849,810	5.9	348,350	5.31	1,045,050
	1953	425,000	299,776	70.5	240,120	44,150,335	4,924,000	2,262,367	5.1	348,350	6.50	876,335
Continental Steel Corp.	1954	394,000	336,149	85.3	232,108	35,661,856	1,600,000	1,993,337	5.6	501,361 ¹	3.97	1,002,722
	1953	394,000	362,048	91.9	252,625	36,761,804	1,700,000	1,603,163	4.4	501,361 ¹	3.20	701,905
GRAND TOTAL	1954	115,324,652	81,900,000 ¹⁴	71.0 ¹⁵	58,700,000 ¹⁴	\$9,977,835,497	\$553,857,391	\$600,383,984	6.0	100,159,286	\$5.99	\$278,186,746
	1953	109,659,002	104,020,000 ¹⁴	94.9 ¹⁵	74,600,000 ¹⁴	12,276,468,175	932,915,834	691,643,865	5.6	96,918,529	7.14	256,659,890
Percent change 1954 over 1953		+5.2	-21.3	-25.2	-21.3	-18.7	-40.6	-13.2	+7.1	+3.3	-16.1	+8.4

1. Payable after 1 year.

2. Adjusted.

3. Includes 14,300 shares purchased under stock option plan but not issued at Dec. 31, 1954.

4. Excludes 4919.43 shares in 1954 and 7843.07 in 1953 represented by scrip certificates.

5. Less 289 shares treasury stock.

6. Value of stock dividend.

7. Includes stock dividend value at \$972,345.

8. Not including 2 pct stock dividend.

9. Plus 5 pct stock dividend.

10. Adjusted for pld stock in treasury: 5640 shares valued \$511,122.

11. Pld.

12. Less.

13. Incl.

14. Est.

15. Not.

Common Shares Outstanding	Number of Preferred Shares Outstanding	Preferred Dividends Declared	Funded Debt ¹	Preferred Stocks	Common Stock	Surplus	Invested Capital	Working Capital	Net Income Percent of Investment	Year	COMPANY
3,662,811	3,602,811	\$25,219,677	\$324,120,277	\$360,281,100	\$879,700,733 ³	.....	\$2,672,832,918	\$752,013,221	7.5	1954	U. S. Steel Corp.
3,602,811	3,602,811	25,219,677	64,475,699	360,281,100	870,325,200	.....	2,319,132,239	346,019,785	9.7	1953	
916,768	933,887	6,537,209	152,174,000	93,388,700	303,459,830	\$683,072,085	1,232,094,615	500,163,398	11.3	1954	Bethlehem Steel Corp.
768	933,887	6,537,209	154,914,000	93,388,700	303,459,830	611,874,056	1,163,636,586	422,594,255	12.4	1953	
737	.....¹¹	846,129	91,468,450	91,468,450 ¹¹	171,252,702	366,597,099	629,318,251	226,397,167	9.1	1954	Republic Steel Corp.
970	282,043	1,692,258	150,818,613	150,818,613	137,024,601	304,830,721	620,878,235	192,310,631	10.0	1953	
0,000	293,568	1,468,000	113,972,000	29,357,000	61,906,000	292,204,000	497,439,000	123,977,000	5.8	1954	Jones & Laughlin Steel Corp.
0,000	293,568	1,468,000	119,973,000	29,357,000	62,007,000	281,036,000	492,373,000	102,687,000	7.4	1952	
698	None	None	55,000,000	None	73,620,450	299,228,093	427,082,106 ¹²	121,769,438	7.5	1954	National Steel Corp.
2,229	None	None	55,000,000	None	73,620,450	290,902,920	418,230,307 ¹²	135,654,425	12.5	1953	
6,618	None	.....	100,000,000	None	105,243,374	227,520,958	432,764,332	183,084,512	5.4	1954	Youngstown Sheet & Tube Co.
2,560	None	.....	100,000,000	None	105,088,053	219,905,076	424,993,129	159,364,161	8.2	1953	
5,892	.....	.....	64,094,018	.....	52,295,736	287,359,698	403,749,452	143,288,613	10.8	1954	Armco Steel Corp.
9,891	.....	.....	75,281,460	.....	52,149,886	261,499,900	388,931,246	134,103,527	9.4	1953	
2,069	.....	.....	97,001,800	.....	78,016,383	209,243,572	287,259,955	158,151,492	15.5	1954	Inland Steel Co.
5,196	.....	.....	111,146,500	.....	62,852,323	186,898,489	249,750,812	145,611,012	14.9	1953	
8,420	237,812	647,766	56,300,000	11,929,278	13,017,911	82,485,486	167,932,675	60,603,270	5.9	1954	Colorado Fuel & Iron Corp. ¹⁵
5,791	239,516	383,074	60,500,000	12,043,396	12,391,021	78,524,612	166,459,029	56,849,970	6.3	1953	
2,175	357,526 ¹⁰	1,787,630	49,191,100	35,752,600 ¹⁰	37,054,498	83,868,214 ¹⁰	205,866,412	64,004,121	5.5	1954	Wheeling Steel Corp.
4,691	357,526 ¹⁰	1,787,630	52,886,900	35,752,600 ¹⁰	37,021,322	80,307,655 ¹⁰	205,968,477	64,318,211	7.0	1953	
9,854	1,581,615	2,318,956	138,185,525	39,540,375	3,200,000	61,098,269	245,984,849	49,643,814	5.5	1954	Kaiser Steel Corp. ¹⁶
0,000	1,600,000	2,334,102	140,557,201	40,000,000	3,200,000	57,090,413	240,847,614	44,876,305	6.0	1953	
0,000	.....	.....	5,850,000	.....	11,060,390	51,800,939	68,711,329	34,245,503	9.8	1954	Sharon Steel Corp.
0,000	.....	.....	6,850,000	.....	11,060,390	51,416,075	69,326,465	36,344,534	10.1	1953	
div.	276,055	1,380,275	31,389,000	27,605,500	20,544,607	40,455,916	119,995,023	38,920,545	4.4	1954	Crucible Steel Co. of America
div.	294,367	1,471,835	36,396,000	29,436,700	17,179,514	39,308,032	122,320,246	39,138,599	5.4	1953	
div.	241,943	1,308,150	36,393,239	24,194,300	14,525,692	41,272,681	116,385,912	24,713,170	3.2	1954	Pittsburgh Steel Co.
div.	241,943	1,307,852	35,395,836	24,194,300	12,847,236	42,088,506	114,525,878	20,849,778	5.2	1953	
6,233 ⁸	121,256	667,475	29,623,266	12,125,600	20,566,605	27,917,502	90,232,973	17,545,037	6.4	1954	Granite City Steel Co.
5,227 ⁸	121,359	667,520	33,613,125	12,135,900	19,398,588	25,730,502	90,878,115	13,395,407	9.1	1953	
one	540,000	708,750	74,500,000	27,000,000	2,974,000	28,039,536	132,513,536 ¹⁰	15,417,820	3.0	1954	McLouth Steel Corp.
one	None	None	64,000,000	None	2,974,000	27,053,396	30,027,396 ¹²	11,111,490	6.9	1953	
1,240 ⁷	None	None	None	None	3,082,737	19,139,945	22,222,682	4,879,173	2.0	1954	Barium Steel Corp.
4,957	None	None	None	None	2,299,859	18,797,158	21,097,017	6,884,038	11.0	1953	
8,719	81,345	355,890	32,507,000	8,134,500	1,689,360	70,249,590	80,073,450	36,711,947	5.3	1954	Allegheny Ludlum Steel Corp.
2,466 ⁸	81,346	355,894	29,556,000	8,134,600	1,689,358	69,738,022	79,561,980	34,601,191	9.8	1953	
one	None	None	4,906,206	None	4,089,125	13,038,509	17,127,634	910,630	11.0	1954	Northwestern Steel & Wire Co. ¹⁷
one	None	None	3,348,192	None	4,089,125	12,019,755	16,108,880	3,400,003	8.5	1953	
3,098	.....	.....	222,956	.....	1,065,491	20,910,757	21,976,248	7,593,704	.....	1954	Newport Steel Corp. ¹⁸
9,273	.....	.....	335,030	.....	1,078,546	21,188,504	22,267,050	8,119,440	11.3	1953	
2,916	None	None	6,430,000	None	3,179,760	23,980,073	33,589,833	13,881,718	6.9	1954	Lukens Steel Co.
3,928	None	None	4,418,000	None	3,179,760	23,078,198	30,675,958	12,076,943	13.0	1953	
8,690	.....	.....	35,060,000	.....	2,419,017	29,702,293	40,265,485	10,991,018	8.4	1954	Detroit Steel Corp.
8,684 ⁹	63,129	315,645	7,000,000	6,312,900	6,560,530	16,774,062	36,647,492	5,425,875	4.7	1954	Alan Wood Steel Co.
9,685	64,575	323,719	3,540,000	6,457,500	6,248,120	15,316,232	31,561,852	8,363,703	11.1	1953	
7,339	84,555	248,093	5,422,000	4,227,750	2,575,940	17,059,208	29,284,898 ¹³	12,012,474	4.1	1954	Copperweld Steel Co.
0,270	86,738	251,289	5,827,335	4,336,900	2,575,940	17,310,920	30,051,095 ¹³	12,818,728	10.5	1953	
.....	.....	.....	82,873,245	.....	2,640,000	19,523,120	105,036,365	21,751,693	3.1	1954	Lone Star Steel Co.
.....	.....	.....	70,843,239	.....	2,640,000	20,101,361	93,584,600	8,078,069	5.2	1953	
20,000	None	None	3,257,366	None	4,125,000	14,724,232	22,106,598	12,130,148	13.9	1954	Laclede Steel Co.
2,500	None	None	3,510,198	None	4,125,000	13,101,082	20,736,280	10,516,128	13.5	1953	
20,000	None	None	None	None	2,604,167	23,674,104	26,278,271	10,506,874	23.3	1954	Keystone Steel & Wire Co.
20,000	None	None	None	None	2,604,167	20,559,331	23,163,498	8,580,944	17.9	1953	
15,050	None	None	3,198,000	None	3,483,500	12,098,211	18,779,711	6,373,712	10.8	1954	Rotary Electric Steel Co.
76,335	None	None	3,698,000	None	3,483,500	11,293,451	18,474,951	5,831,691	13.0	1953	
22,722	.....	.....	2,600,000	.....	7,018,789 ¹²	11,984,235	21,603,024	9,430,096	9.7	1954	Continental Steel Corp.
31,905	.....	.....	2,800,000	.....	7,018,789 ¹²	10,993,620	20,812,409	8,199,653	8.3	1953	
86,746	8,415,502	\$43,809,645	\$1,602,739,448	\$708,053,903	\$1,892,972,327	\$4,185,896,195	\$8,205,155,029	\$2,666,537,183	7.3	1954	GRAND TOTAL
59,890	8,199,679	43,800,059	1,429,424,328	683,722,996	1,826,050,595	3,872,678,167	7,565,457,301	2,057,228,413	9.1	1953	
8.4	+2.6	no change	+12.1	+3.6	+3.7	+8.1	+8.5	+29.6	-19.8		Percent change 1954 over 1953

11. Pld. stock retired Aug. 31, 1954.

12. Less treasury stock.

13. Includes funded debt.

14. Estimated, based on national operating rate.

15. National rate for industry by AISI.

16. Fiscal year.

17. Fiscal year ended July 31.

18. Fiscal year ended Oct. 31.

19. Fiscal year ended June 30.

Italics indicate loss or credit.

THE IRON AGE, April 7, 1955

STEEL: Modernization Eased '54 Pains

Earnings declined less than sales . . . End of excess profits tax helped raise net income pct of sales . . . Labor relations improved . . . End of year ingot rate rising, confidence up—By W. G. Brookfield.

♦ IT TOOK a slow year like 1954 to prove the value of modernization and better management in the steel industry.

Despite a decline of nearly 19 pct in sales from record-breaking 1953, 29 producers representing 93 pct of the industry reported net earnings were off only 13.2 pct.

Further, the annual IRON AGE financial analysis shows that net income per cent of sales was 6 pct for 1954, compared with 5.6 pct in 1953.

Other important factors in the better-than-expected financial showing of the steel producers was elimination of the excess profits tax and the ability of steel management to roll with the punch.

Labor Front Peaceful

Fortunately, the slump was of shorter duration than most expected, and the industry was on the way back in the second half. Consumers gradually reversed their inventory-reducing philosophy, gained confidence in the outlook, and were pushing the ingot rate upward as the year ended.

Actually, the year was a good one in many respects. The industry solidified its good relations with steel labor, and many companies followed the lead of U. S. Steel Corp. in carrying out management-labor visits to basic steel and steel fabricating plants. The stockholder also got a better break. Common dividends declared were up 8.4 pct over 1953.

Industry leaders intensified their campaign for a better deal on tax credit for depreciation. Producers have been arguing for years that depreciation allowances are not

enough to cover cost of replacing worn-out equipment. One spokesman warned that continuance of present policies "automatically guarantees something of a future crisis."

Steel labor won a wage-fringe package totaling 12¢ an hr in June. In July, steel producers raised prices \$3 per ton to compensate. Other price changes, some up, some down, were made subsequently.

Taxes Declined

Net earnings for the 29 companies covered by the survey were \$600.4 million, compared with \$691.6 million the previous year, a decline of 13.2 pct.

Net sales and operating revenues totaled \$9.97 billion, a drop of 18.7 pct from the \$12.3 billion during the previous year.

Provision for Federal income taxes registered a sharp decline. The set-aside amounted to \$553.9 million, compared with \$932.9 mil-

lion in 1953, a drop of 40.6 pct.

Common dividends declared were \$278.2 million, an increase of 8.4 pct over 1953's \$256.7 million. Number of common shares increased 3.3 pct—from 96.9 million to 100.2 million. Value of common stock rose 3.7 pct, from \$1.8 billion in 1953 to \$1.9 billion last year.

Number of preferred shares rose from 8.2 million to 8.4 million, up 2.6 pct. Change in preferred dividends from 1953's \$43.8 million was negligible. Value of preferred stock rose 3.6 pct—from \$683.7 million to \$708.1 million.

Stocks Earnings Down

Funded debt totaled \$1.6 billion, compared with \$1.4 billion in 1953, an increase of 12.1 pct. Invested capital rose 8.5 pct—from \$7.6 billion to \$8.2 billion.

Working capital was \$2.7 billion, compared with \$2.1 billion, a rise of 29.6 pct. Surplus was up 8.1 pct.

'54 Steel Earnings—These Firms Led

Net income, in thousands of dollars, of 12 steel companies rated in order of reported 1954 profits, with pct of change from 1953 is as follows:

COMPANY	1954	1953	Pct of Change
U. S. Steel Corp.	\$195,417	\$222,007	-12.0
Bethlehem Steel Corp.	132,837	133,947	-0.8
Republic Steel Corp.	52,075	56,743	-6.8
Inland Steel Co.	41,207	33,067	+21.9
Armco Steel Corp.	41,100	33,902	+21.2
National Steel Corp.	30,334	49,174	-38.3
Jones & Laughlin Steel Corp.	25,032	31,015	-19.3
Youngstown Sheet & Tube Co.	20,182	30,839	-34.6
Wheeling Steel Corp.	9,595	12,458	-23.0
Kaiser Steel Corp.	7,926	9,121	-13.1
Colorado Fuel & Iron Corp.	7,051	8,031	-12.2
Keystone Steel & Wire Co.	6,114	4,149	+47.4

Report To Management

Employment Joins the Uptrend

Last dull throb of the recession hangover is beginning to fade. While most business indicators have been pointing sharply upward since last fall, improvement in employment conditions has been hardly noticeable. But now it looks as though the turning point for labor is here.

Signal flags that the labor situation is improving are popping up all over. There has been a marked reduction in the factory layoff rate which according to latest statistics is running at an 11 workers per 1000 clip compared with 15 per 1000 in the previous month. Current layoff rate is only half what it was a year ago and the recent decline in layoffs was the second sharpest cut since World War II.

Particularly significant in the labor pickup: the factory hiring rate in February held at the January level, marking the first time during the postwar years that there has not been a drop between January and February.

Most marked improvements in the layoff rate were in primary metals, fabricated metals, machinery, food, tobacco and textile industries. For most other industries the change in layoffs is in line with seasonal expectations.

Industries showing the greatest improvement in hiring rates are: primary metals, electrical machinery, instruments, tobacco, apparel, petroleum, and miscellaneous manufacturing. Smaller than usual declines in the hiring rate showed up in fabricated metals, machinery, transportation equipment, food, rubber and leather industries.

Also the workweek, which slipped off slightly in January is again rising, hitting 40.5 hours compared with 40.2 hours in January. Except for December '54 this is the longest the workweek has been since August 1953.

You can figure the employment outlook will continue to improve until the summer slowdown comes—and even this tapering off period won't be as severe as it was last year.

Watch for Pickup in Freight Car Loadings

Business pickup for the railroads is continuing. Outlook for second quarter is that freight car loadings will be up about 7.1 pct from same period last year.

Total loadings will amount to more than 7 million cars in the second quarter compared to about 6.6 million in second quarter of '54. Biggest increase will be in auto and truck shipments which should be up about 33 pct. Ore and concentrate shipments, reflecting greatly stepped up steel production, are expected to climb 20 pct. A 14.4 pct gain is expected for shipments of vehicle parts, and iron and steel is pegged to gain 11.5 pct.

Products for which declines in freight car shipments are expected include: hay, straw and alfalfa, off 11.3 pct; cotton seed, soy beans, down 10.5 pct; machinery and boilers off 4.7 pct.

And There's Strength at Retail Level

Retail trade continues to show strength. Total sales of retail stores in February amounted to \$12.8 billion about the same as in January, but a solid 6 pct ahead of February 1953. Big factor in the strength shown in retail sales which have been climbing sharply since the fall of '54 is the amazing new car sales pace. It's estimated that new car sales account for more than half the gain in retail trade volume.

They Just Ran Out of Gas

Maybe it's a sign of the pressure of the times, but 53.8 pct more motorists were stranded without gas than in 1953. Paradoxically, motorists were less forgetful about their car keys. American Automobile Assn. reports that last year there were only 717,000 calls for emergency lock and key service compared with 803,000 in '53. Major cause of emergency car troubles continues to be tires. Battery and electrical failures ranked second.

INDUSTRIAL BRIEFS

Sold Out . . . Exhibit space for next year's exposition of the Material Handling Institute is already sold out, according to Institute President R. H. Davies, vice-president in charge of Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Atomic Locomotive . . . Contract for the first study in the nation's history of a new nuclear-power reciprocating engine for locomotive propulsion was signed recently in Washington. James F. Connaughton, vice-president, Baldwin-Lima-Hamilton Corp., and Joseph L. Henning, Denver & Rio Grande Western RR, signed for the respective companies making the study.

New Purchase . . . Glidden Co. has purchased the assets of the Zapon Industrial Finishes Div., Atlas Powder Co., Wilmington, Del. This includes all notes and accounts receivable, patents, formulas, trademarks, certain specialized equipment and the sales and technical staffs of the Zapon Division.

Represents . . . Cameron & Barkley Co. has been appointed by Cooper Alloy Corp. as an authorized Southern distributor of stainless steel valves, fittings and accessories.

New Location . . . Ziv Steel & Wire Co. has moved its offices and warehouses to 2225 S. 38th St., Milwaukee.

Research Grants . . . Wright Air Development Center, Wright-Patterson Air Force Base, and the Office of Ordnance Research, have awarded Illinois Institute of Technology grants totaling \$49,714 for fundamental studies in stress analysis.

Foreign Award . . . England's highest award for outstanding achievement in the science of metallurgy, The Bessemer Gold Medal, was given to Dr. John Chipman, head of the department of Metallurgy at MIT.

Awarded Contract . . . Monongahela Connecting Railroad Co., subsidiary of Jones & Laughlin Steel Corp., recently awarded a contract to Greenville Steel Car Co., for repairing 75 mill-type gondola cars. The cars will be used at the Pittsburgh Works of J&L.

Blown In . . . D-6 blast furnace was blown in recently at American Steel & Wire Div.'s central furnaces and docks department after extensive repairs and improvements. Shut down since last August, the familiar old spire in Cleveland's industrial valley began its 43rd yr of service pouring iron.

Negotiations . . . White Motor Co., Cleveland, is negotiating an agreement for the purchase of the Springfield, O., engine division of National Supply Co., Pittsburgh. Under the arrangement National Supply would serve as sales distributor for White engines in oil fields throughout the world.

Merged . . . Wellsville Works and Steam Turbine Sales Div., Worthington Corp., have been merged and will be known as the Steam Turbine Div. Arthur F. Reinking has been appointed general manager of the division.

THIS IS LOW COST WELDING!



When a touch on a button moves weldments like these into the correct, most convenient position for a downhand pass, you get more arc time, more welding at lower cost. C-F power operated Positioners rotate the work in a full circle at any point in a range of 135° from the horizontal—giving welders a choice of an infinite number of downhand welding positions instantly.

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C-F Positioners are available in Hand or Power operated models, and are made in capacities up to 30,000 lbs. and larger.

Write for the new C-F Positioner Catalog

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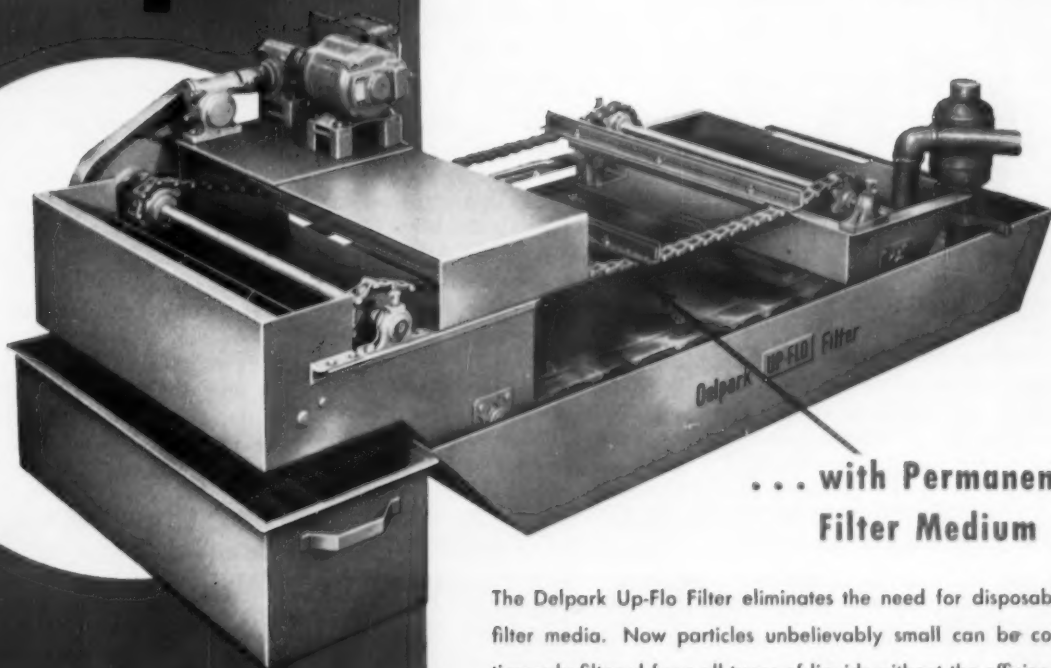
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Corvette Experience Shows Dividends

Plastic patches for metalwork grow from Corvette . . . May cut body repair costs by 75 pct . . . Aluminum coated valves increase valve life on new engines . . . Ford test drives tractors—By T. L. Carry.

♦ **PIONEERING** the use of plastics for auto bodies is beginning to pay off for Chevrolet, the auto industry, and the auto owner.

Know-how gained in the manufacture of the Corvette led to a method of using plastic to patch torn and rusted automotive sheet metal. Chevrolet people claim that the new technique reduces time, labor and material costs on auto body repair by as much as 60 to 75 pct. Even leaky exhaust pipes, manifolds and gas tanks have been successfully mended.

The idea of using plastics for patching auto bodies was first suggested by E. L. Harrig, general service and mechanical manager of the division, who had been following the development of the plastic body for Chevrolet's Cor-

vette. Men who were fabricating plastic panels for the sports car body had noticed a peculiar affinity of the resins they were using for metal tools.

Passes Tests . . . The formula finally adopted by Chevrolet consisted of an epoxy resin applied to the glass fiber that is the matrix of the plastic. Chevrolet says reinforced glass fiber patches treated with this resinous mixture are virtually impossible to separate from metal once the material has set.

Engineers set up a test comparable to a run over the Alberta Highway in the dead of winter by patching the door of a truck cab, installing an automatic door-slaming device and putting the truck in a cold room. Temperatures were

dropped to 50° below zero and the truck door was slammed several thousand times. When there was no sign of the patch falling off the door, it was pounded with hammers without effect.

The truck was then taken out of cold storage. The patch was subjected to heat lamps but the repair job held up as good as new.

Application of the patch is similar to the fabricating of all plastics. A layer of glass fiber is saturated with the epoxy resin and dried into a solid plate. Skilled workers are unnecessary except for finishing operations. Chevrolet claims the adherence of paint to the epoxy resins is much better than to polyester resins. Officials say that if the plastic is properly bonded to the sheet metal, the only way to remove it is to cut it away.

Aluminum Coated Valves . . . In another GM technical development, life of engine valves has been increased two to five times through an aluminum coating treatment now used by the Valve Div. of Thompson Products Co., Cleveland.

Aluminum coating of the valve face forms a thin layer of hard alloy. Many millions of these coated valves have been made so far and a new, completely automated line has been put into production.

The new coating is standard on exhaust valves in three different engines in 1955 cars and will be used on both intake and exhaust valves in at least one 1956 model.

Turn Page



AUTO VALVE faces are coated with aluminum in a process that increases life of engine valves from two to five times.

Cuts Use of Chromium Plating Material by 50%

"Mr. Cost Cutter" reveals how plant saves money while it improves results

Results achieved by an automotive company tell a story of major improvement in chromium plating operations.

The advantages of the Unichrome SRHS Chromium Plating Solution as pointed out by United Chromium were first checked by this company's critical research division. Shortly thereafter, the SRHS solution replaced the ordinary solution in a fully automatic plating machine.

All benefits were confirmed. Loss by dragout dropped since the solution was more dilute. Loss by spray carried off in the ventilators diminished because the higher efficiency of the SRHS bath reduced the wasteful gassing which causes spray. In fact, records show that consumption of chromium plating salts used to maintain the bath was cut *more than half*. In addition — faster plating speed was obtained; also brighter deposits, and better coverage.

This company now has every chromium plating tank in the plant working with, and saving with, Unichrome SRHS Chromium.



MORE WAYS UNITED CHROMIUM HELPS TO SAVE ON COATING OF METALS

Matched Plating Processes

The first set of matched copper, bright nickel, and chromium plating processes has been developed by United Chromium. Compatibility of the processes plus the undivided service responsibility they offer can assure the very finest chromium finishes at a new low cost.

Sprayable Vinyl Plastisol

Unichrome Coating 5300, developed by the Organic Coatings Division of United Chromium, cuts costs for corrosion-proofing tanks, ducts, and other equipment. This sprayable vinyl plastisol produces thick chemical-resisting coatings with advantages over sheet and paint linings built up to comparable thickness.

Economical Plating Equipment

United Chromium supplies equipment for complete plating installations. Tanks, rectifiers, heaters, and other Unichrome equipment are, from experience, designed for efficient operation and genuine economy.



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United Chromium offers you the advantages of: (1) 25 years of specialized experience in metal finishing; (2) Wide experience in both organic and plated finishes; (3) A diversified line of products for decorative and functional finishing — including plating processes and equipment, protective coatings, chemical conversion coatings for zinc; (4) Thinking geared to cost-cutting, product-improving possibilities. We'd welcome an opportunity to help you "Finish it better AND SAVE."

Waterbury 20, Conn. • Detroit 20, Mich. • Chicago 4, Ill. • Los Angeles 13, Calif.

In Canada: United Chromium Limited, Toronto, Ont.

April 7, 1955

97



Fewer tools, lower costs, no rejects ...with Tinnerman **SPEED NUTS!**



A change to Tinnerman SPEED NUT brand fasteners can eliminate production problems in addition to saving important assembly dollars! Here's proof. The Peterson Manufacturing Company, Kansas City, Missouri, formerly assembled its Combination Stop and Tail Lamp with four stamped and tapped brackets.

Costly equipment was necessary to manufacture the brackets, and misalignment of holes often made assembly difficult. Damage to units on the assembly line averaged 5%!

Four SPEED NUTS have changed everything! Material costs have been cut a whopping 60%! The tools to manufacture the brackets are eliminated. The easy lead-in provided for screws by the SPEED NUT impression cuts assembly time 20%, increases production by 15%. Misalignment of holes presents no problem for SPEED NUTS and assembly-line damage is completely eliminated!

Let Tinnerman help with your fastening problems. Ask your Tinnerman representative or write for complete details on our Fastening Analysis Service.

TINNERMAN PRODUCTS, INC. • BOX 6688, DEPT. 12, CLEVELAND 1, OHIO
Canada: Dominion Fasteners, Limited, Hamilton, Ontario. Great Britain: Simmonds Aero-accessories, Limited, Treforest, Wales. France: Aerocessaires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine). Germany: Hans Sickinger GmbH "MECANO", Lengnau-Lippe.

TINNERMAN ***Speed Nuts***
FASTEST THING IN FASTENINGS™

TYPICAL USES



"U" type SPEED NUTS cut assembly costs, maintenance on farm equipment.



Special SPEED NUT eliminated production problems on washing machine motor mount bracket.



SPEED GRIPS eliminated costly repairing of truck radiators returned because of weld breaks.



More than 6000 shapes and sizes.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Apr. 2, 1955	186,556	32,105
Mar. 26, 1955	187,993	29,354
Apr. 3, 1954	122,752	23,746
Mar. 27, 1954	125,341	24,245

*Estimated. Source: Ward's Reports

Increases Hardness . . . Test work is being conducted on these valves for other makes of cars. With the trend to higher compression engines and more wear and tear on valves, extensively wider use of the process is probable.

Aluminum coating of the heated valve faces results in an alloying of the base metal and the aluminum into a hard iron alloy. Besides greatly increased hardness, it retains its ductility unlike conventional heat treating methods.

Field Expands . . . The aluminum coating process dates back as far as 1948 but its application to engine valves on a mass production basis is being done now for the first time. The process was developed by GM Research Laboratory Div., initially to extend the life of mufflers through a protective coating. The process was tried on exhaust valves and a pilot production plant was set up.

A year ago the valves were tried on one 6-cylinder car. This year they are being used on a six and a V-8 of another make. Other lines are expected to follow.

Tractors:

Ford proving ground adopts auto test methods.

The Tractor and Implement Div. of the Ford Motor Co. has drawn extensively on the company's experience in testing automobiles for the design of a new proving grounds to test farm machinery.

To be known as an Evaluation Center, the new proving grounds will combine the features of an automobile test track with methods used in farm equipment laboratories.

Merritt D. Hill, assistant gen-

eral manager of the tractor division, said the center will be located on a 4-acre wooded plot at the division's general offices in Birmingham, Mich.

No Drivers . . . The center will have four "torture" courses inside a one-third mile oval test track. Here engineers will be able to put production and experimental tractors and farm equipment through intensive tests.

A heavy pole will be imbedded in concrete at one end of the track. Tractors will be tethered to this pole when it is desired to test endurance and performance without the necessity of a driver.

Dream Trucks:

Production scheduled for GMC's L'Universelle.

GMC Truck and Coach Div.'s dream truck, L'Universelle, currently on display in the corporation's Motorama, will probably go into production a little over a year from now.

Word that L'Universelle was actually going to be available to the public came from General Motors' president, Harlow Curtice, while

Automotive News

he was visiting Motorama in San Francisco. Public demand for the vehicle is so great it cannot be ignored.

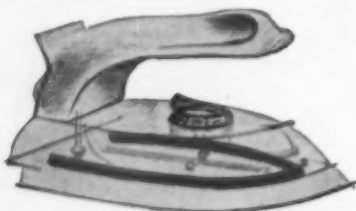
L'Universelle is truly what its name implies — all-purpose. Primarily designed as a super de luxe panel delivery truck, engineers at the division's styling studio also envisioned it as a taxi, station wagon or sportsman's car after minor manufacturing changes were made. As a matter of fact, many uses the public suggested for the vehicle overwhelmed even the wildest dreamers at the GM truck division.

Many Uses . . . What is there about L'Universelle that makes it so appealing to the public? Part of its popularity can no doubt be attributed to the increase in demand for a station wagon-type vehicle. But the styling of L'Universelle cannot be overlooked. The GM Truck creation is 10 in. lower and 10 in. shorter than current model panel delivery trucks.

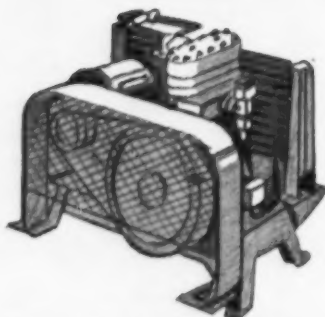


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TO *jog a designer's imagination*



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IN HAND IRON**

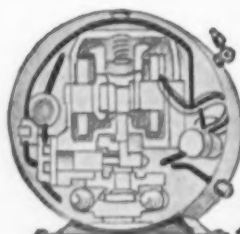


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Ductile

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New Aid-for-Asia Push Takes Shape

Government agency prepares case for economic and military help of backward areas . . . Two billion down as starter of 8-year program . . . See the Administration rallying behind proposal—By G. H. Baker.

◆ **PROPOSERS** of more-aid-for Asia are looking to President Eisenhower to make the opening move in a campaign to convince Congress of the need for a new, 8-year military and economic assistance program in the Far East.

Foreign Operations Administration (FOA), now preparing arguments to be used in this drive, is counting on the President to offer recommendations for increased assistance to underdeveloped Asian countries as a means of combatting Communism. These recommendations may be ready for Capitol Hill study this month.

The amount requested to get the new program started will be more than \$2 billion, of which \$915 million would be used for economic and technical aid, including American-produced capital goods. Contained in the initial request also would be \$675.5 million for military equipment and \$550 million for material to support military forces.

Spend No More . . . Not all of the \$915 million would be intended for spending in fiscal 1956. FOA estimates that the amount actually spent should be \$585 million. This latter sum coincides with Treasury Sec. Humphrey's forecast of actual spending for economic aid to Asia in the coming fiscal year.

Agreement of the spending estimates is important to White House strategists, who want to be sure the proposal offered to Congress is coordinated among key Administration officials. The dangers of failure to achieve coordination are pointedly indicated in

the current floundering attempts to obtain Congressional approval of the Administration's highway bill.

Secretary Humphrey has repeatedly shown that he is opposed to unbridled giveaways, but he now says "selective" development programs can play a large part in creating friendlier relations between this country and foreign nations. His position makes it apparent that a firm Administration proposal for more Asian aid can be presented within a short time.

Push Business Census . . . Preliminary results of the current government census of manufactures will, if the present tabulating schedule is followed, be in businessmen's hands next fall.

Census Bur. officials aren't underestimating the size of a job encompassing data in some 2.5 million to 3 million questionnaire forms. They believe, however,

that machine-handling is going to cut deeply into the amount of the time required to total the results.

Rapid tabulation of business information will begin in June. Forms were mailed out by the bureau earlier this year and are being returned at a speed which officials find encouraging.

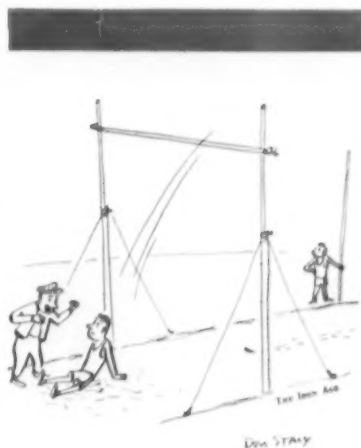
Where Water Went . . . For the first time, the census is to provide facts on industrial use of water. Some 25,000 large industrial users of water are being asked to tell what quantity passes through their facilities, where it comes from, and for what purposes it is employed.

Incomplete data from the 1953 annual survey of manufacturers indicate that a sizeable number of plants use at least 20 million gal of water annually. Blast furnaces were shown to have the highest ratio of water use per employee. The figure is nearly 24 million gal per employee.

High ratios also are found in the electro-metallurgical, alkali and chlorine products, and organic chemicals industries.

List Defense Plants . . . Virtually complete is the Defense Dept. revision of its list of firms that will be depended on in wartime to produce essential military weapons and equipment.

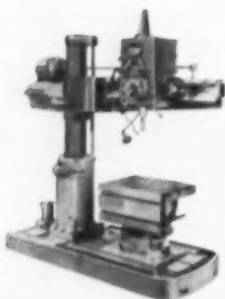
Late in 1954, this Alphabetical Register of Planned Wartime Materiel Suppliers included the names of about 34,000 U. S. companies. It's being substantially reduced, and the new version will list approximately 24,000 firms, all of them deemed capable of fitting



"GREAT! Now try it with the pole."

what's new?

flamatic-hardened radial column*



* CINCINNATI LATHE AND TOOL COMPANY'S
NEW "HARDCLAD" RADIAL DRILL



Here's a Flamatic-hardened column that is designed to resist scoring and hold its accuracy substantially longer than conventional columns. This column, a new feature of the Cincinnati Lathe and Tool Company's radial, is a centrifugal casting of close-grained iron, surface-hardened on a special Cincinnati Flamatic machine which holds the piece vertically while the flame head assembly with integral water quench moves from bottom to end of flame hardened area.

If you make columns, rolls, or any cylindrical parts, check into Cincinnati Flamatic surface hardening. It may add years of accuracy and service to your products. And it may cost less—in initial investment and operating costs—than other hardening methods. Write for further information.



flamatic

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

their production into latest mobilization plans.

Pentagon officials, realizing they may be charged with shaving down the national mobilization base, say the longer register contained thousands of references not now usable. Some of the firms listed no longer are equipped to turn out military items; others can produce items not now considered essential.

Upshot of the revision project, the Defense Dept. believes, will be a valuable list of those companies which can make products that have become critical because of technological advances since World War II.

Warn On Warnings . . . Military planners, uncertain as to Russia's progress in the long-range missile field, are pushing for fast results in construction of the Defense Early Warning (DEW) line, designed to warn the U. S. and Canada of raids by conventional aircraft and subsonic missiles.

Recently, the Defense Dept. revealed that it is using four-engine transport aircraft to speed delivery of equipment to points in the Canadian Arctic. This airlift supplements contract cargo operations by Canadian commercial flying firms.

During the summer, U. S. ice-breakers will transport both personnel and equipment to the eastern end of the DEW line. Construction gear may be delivered to selected sites as early as July.

Warnings that the U. S. has no sure knowledge about the status of the Communists' missile-building activity come from Lt. Gen. Donald L. Putt, who heads Air Force research and development.

Push Atomic Work

General Dynamics Corp., New York, has approval from Atomic Energy Commission to make a 1-year study of ways to build components for nuclear power reactors.

The firm also will look into problems of decontamination, waste disposal, and use of by-product radiation. It expects to spend \$200,000 in the study. AEC will

provide General Dynamics with information and consultation services as needed.

In other actions involving AEC, the agency has set up a licensing division under Harold L. Price, of Chevy Chase, Md., and has agreed in principle to sell 10 tons of heavy water to the Italian government.

The new licensing division will draft and administer AEC regulations covering the licensing of atomic energy operations by private industry. Mr. Price and other AEC staff members have begun initial preparation of the regulations.

Italy hopes to use the heavy water in its first research reactor. Two U. S. plants manufacture this material for reactors at AEC facilities in South Carolina.

Reds:

New bill would curb unions with Communist bosses.

A bill to give the National Labor Relations Board power to rule a union dominated by communists "out of compliance" with the Taft-Hartley Act and take away its bargaining rights is now pending before a Senate Labor subcommittee.

The measure, sponsored by Sen. Hubert H. Humphrey, D., Minn., would erase a recent Federal appeals court decision by permitting NLRB to remove bargaining privileges from a union whose officers falsely file non-Communist affidavits.



"What do you look for in a cigarette?"

WASHINGTON NEWS

At present, the court's decision stands that even though a union leader is convicted of signing a false non-Communist affidavit, the conviction does not permit the Board to rule the entire union out of compliance with the labor law and remove its bargaining rights.

Lets Board Act

In another case, still being litigated, lower courts have held that NLRB does not have the power to determine whether an affidavit is false or not.

Sen. Humphrey's bill would give the Board discretion to rule an affidavit false if an official refuses to testify under oath before a grand jury or legislative committee on the veracity of the affidavit.

In such cases, or when the official has been convicted of falsely signing an affidavit, the Board would be permitted to declare the union out of compliance with the labor law. A 30-day notice period would be required to give the union time to oust the Reds.

Injury Rates Decline

Employee safety in manufacturing plants is improving steadily, Labor Dept. statistics show. Throughout 1954, on-the-job injuries were at a lower rate than those a year earlier. In the quarter ended last Dec. 31, the rate for all manufacturing plants was at a new low of 10.7 disabling injuries per million manhours worked.

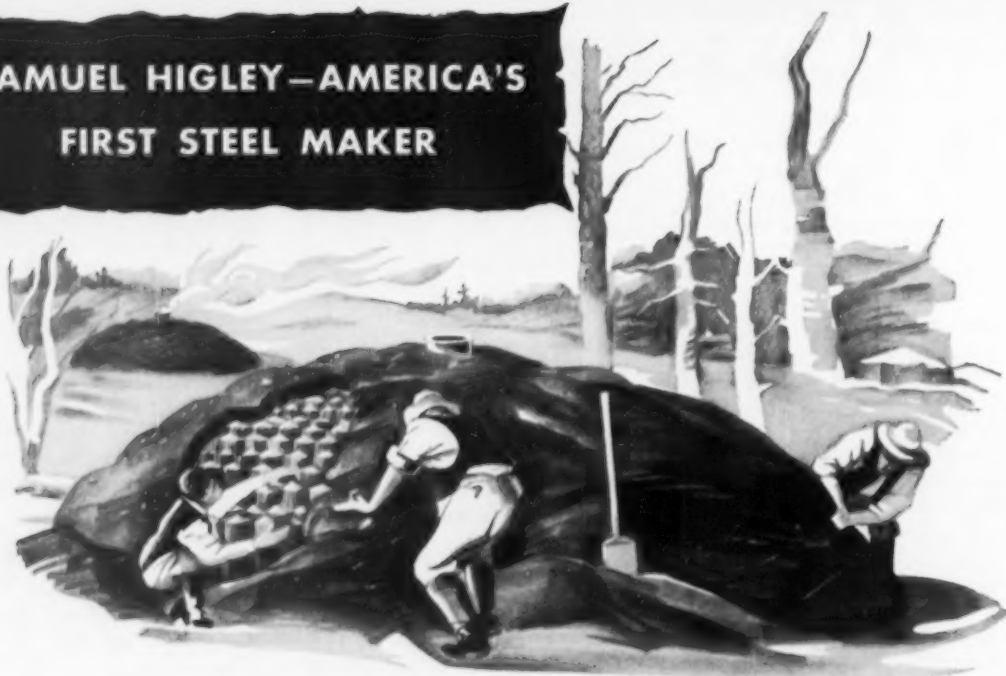
This excellent record helped push the injury-frequency rate down to 11.5 for the entire year. Drop is 14 pct below the 1953 figure.

In the primary metals field, rates of disabling accidents were lower last year than in 1953. Blast furnaces and steel mills made the best record in this group, with a figure of 4.3; welded and heavy-riveted pipe mills followed with 8.1.

There was improvement throughout the fabricated metals group except in the metal door, sash, frame, and trim field, where the figure climbed from 19.9 to 21.2.

FAMOUS FIRSTS IN THE IRON & STEEL INDUSTRY

SAMUEL HIGLEY—AMERICA'S FIRST STEEL MAKER



The credit of producing the first steel in America goes to Samuel Higley, of Simsbury, Connecticut. In the Connecticut State Library there is a certificate signed by two blacksmiths . . . Phelps and Drake, stating that Higley took specially shaped wrought iron from them and later returned with the iron refined into steel. This certificate is dated May 7, 1728, but it has been established that Higley's first experiments bore fruit in or around 1725. Based on the testimony on this certificate Higley and his associate Dewey were awarded patent rights to run for ten years.

It is believed Higley made his steel by the cementation process. In this process charcoal was packed around wrought iron bars and the whole mass was

heated in a closed furnace for a week or more. The longer the iron was heated, the more carbon it absorbed from the charcoal. This "blister-steel", or rather an iron core with a steel surface, was poor in quality by modern standards, but it was the beginning of one of America's greatest industries.

The J. E. Baker Company discovered years ago how to prepare better dolomite. The results of constant experimentation developed BAKER'S MAGDOLITE, the original dead-burned dolomite. Today BAKER'S MAGDOLITE delivers more uniform ingots with less defective production material. Try BAKER'S MAGDOLITE today. It is always 5 ways better: Composition, Preparation, Strength, Economy, Quality.

3-55

ANOTHER FAMOUS FIRST

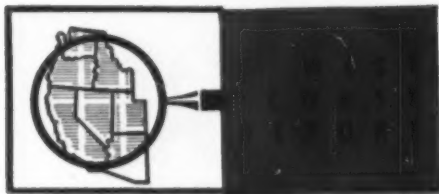


BAKER'S MAGDOLITE

The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO



Convair Plans Giant Milling Machine

To be developed for Air Force, it will cut all metals used in aircraft making . . . Will reduce tool engineering time, cut other costs . . . GM's Coast output up 53 pct . . . Expansion planned—By R. R. Kay.

♦ AIRCRAFT INDUSTRY'S first automatic milling machine is in the works.

It could well be a major step in cost reduction and improved quality in making complex aircraft structures or dies.

What's it expected to do? Reduce tool engineering lead time. Make big savings in materials. Save \$50,000 on just one part by eliminating some families of tooling. Save up to 85 pct of present lead time on some parts; on more complex parts, 15 pct. Provide built-in and almost perfect quality control. Do away with intermediate inspection points.

Does Everything . . . The milling machine will have a 20-ft bed with 10-ft clearance; rotary turntable; two vertical and two horizontal cutting heads. Both vertical heads or both horizontal heads can be operated at the same time. Cutting angles of the tools can be varied. There will be a variable table speed. And it's felt the machine will be big enough to handle any aircraft part likely to be needed.

The machine will cut aluminum alloys, steels, titanium, and other metals used in aircraft manufacture. It will be able to produce wing spars, milled skins, contoured forged bulkheads, and will sink dies, according to Thomas E. Piper, assistant to the executive vice-president, Convair Div. of General Dynamics Corp. The San Diego firm has a \$1.1 million U. S. Air Force contract to develop the equipment. It's an 18-month project.

Production Gains . . . Look for a big boost in western water heater

manufacture. Production here—now roughly 40 pct of the nation's output—will be upped with a new \$2.5 million A. O. Smith Corp. plant in California. Ready by mid-1956, it's planned to produce 30,000 to 40,000 water heaters per month. Francis S. Cornell, vice-president and general manager, says the new factory will also make some 4000 air-conditioning units per month.

THE IRON AGE has information that Reynolds Metals Co. is buying the 44-acre, 373,730-sq-ft Pacific Electric Railway shop buildings at Torrance (Los Angeles area). A multi-million dollar extrusion plant and aluminum press facility is planned.

"General Motors' California output of cars and trucks in the first quarter will total 112,000 units, a 53-pct increase over last year's volume," Harlow H. Curtice, president, said in San Francisco. And despite this, GM has a shorter supply of cars in California "than anywhere else in the country."



"Somethin' so satisfying about landscape painting."

What about GM's future plans in the West? "We undoubtedly will have to add to our capacity here if we are to keep up with the pace of West Coast growth."

Expansion Plans . . . These companies will be needing metalworking products and services for new facilities:

Furane Plastics, Inc., Los Angeles, doubled plant facilities for its tooling resins.

Convair Div. of General Dynamics Corp. will put up a \$3.5 million wind tunnel in San Diego to test models of aircraft and guided missiles up to 4½ times the speed of sound. Another \$1.4 million will go for new plant equipment and \$980,000 for engineering and laboratory facilities.

North American Aviation's Santa Susana, Calif., Propulsion Field Laboratory, will get a \$1.5 million calibration and test building.

Window Sales, Inc., Hayward, Calif., is building a \$100,000 plant to manufacture metal windows.

Sherwin Williams Co. of California, Oakland, plans a \$1 million can-making plant.

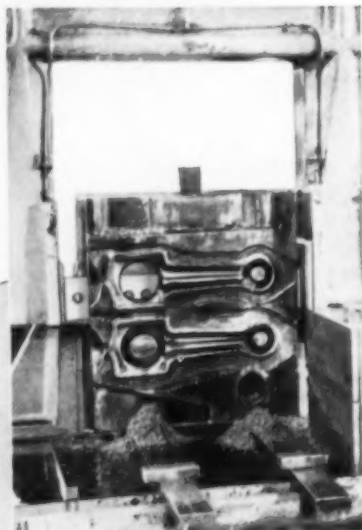
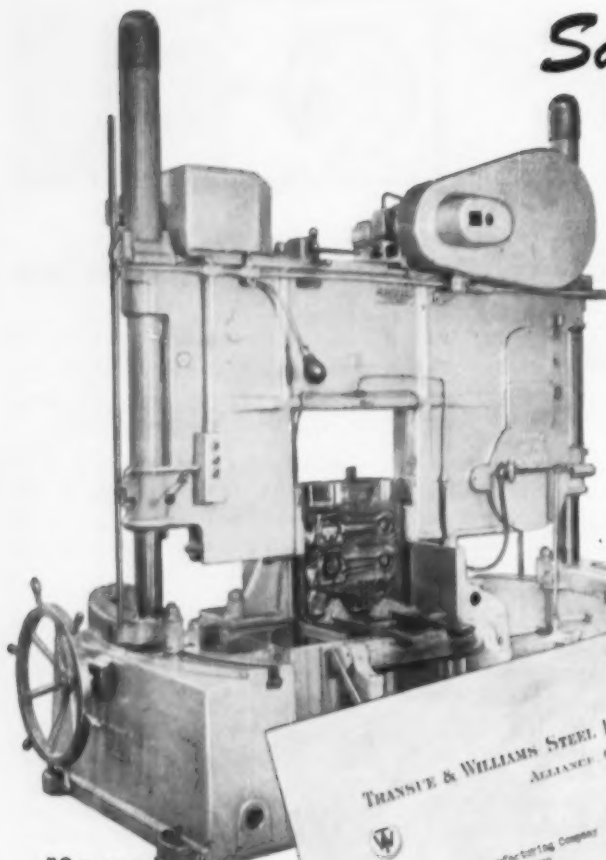
Automatic Sprinklers of the Pacific, Inc., and Bennie Brown's Screw Machine Products, both of San Leandro, Calif., are expanding.

Wham-O Manufacturing Co., San Gabriel, Calif., firearm manufacturer, is putting up a new building.

Sundstrand Tool Co., Rockford, Ill., will build a \$5-million Denver-area plant to make electrical aircraft equipment.

Universal Electronics Co., Santa Monica, will produce electronic-DC power supplies.

Save 25% Time in Re-facing Dies... 20% Time-plus steel- in Shanking Them



"Our saw has been in operation 2 years. Most of our sawing has been on die blocks..."

"We are removing the worn impression from the face of die blocks for reinking... we recently removed 2 inches from face of blocks measuring 19" x 17"... sawing time 296 minutes for 2 blocks... Set up time 31 minutes... grinding time 155 minutes... total 8 hours and 2 minutes.

"Average time for removing same amount of stock from these die blocks with planer, 10 hours and 15 minutes. Sawing saves approximately 25% of time..."

"With regard to removing excess stock to provide shanks... we remove approximately 90% of metal by sawing after which block is sent to planer for finishing. Time for sawing and planing is 20% less than planing alone.

"Pieces of stock removed by sawing are useful in many ways... saves buying of some trimmer steel."

TRANSUE & WILLIAMS STEEL FORGING CORPORATION
ALLANAGE, OHIO

Armstrong Blum Manufacturing Company
5700 W. Bloomingdale Avenue
Chicago 39, Illinois

Testimonial:

We felt that you would be interested in having some of the facts we have compiled on our No. 24 Marvel Metal Cutting Saw. As you know, our saw has been in operation approximately two years. Most of our sawing has been on die blocks furnished us either by the Department of Ordnance or by the Ordnance Department.

In view of the fact that we are removing the worn impression from the face of the blocks for reinking with the use of this saw and that it works to a very definite advantage, depending somewhat on the amount of stock to be removed from the face of the die. On a job which we recently sawed two inches from the face of blocks measuring 19" x 17", our sawing time was 296 minutes for the two blocks, set-up time was 31 minutes, and the time required for grinding the face of blocks was 155 minutes, total 482 minutes or 8 hours and 2 minutes. To remove the same amount of stock from these blocks with our planer, over an average of eight sets of dies required 10 hours and 15 minutes for planing and grinding, or approximately 25% more time. We might point out that our labor rate for a saw operator is less than that being paid to a planer operator, which increases the saving somewhat. From our experience, we find where only one inch is to be removed from the face of the die, the saving is somewhat less, but in our case the two very definitely is favor of the saw.

With regard to removing the excess stock to provide shanks on our dies, this naturally varies with the size of blocks and the depth of the shank required. However, our average over a year and a half period has indicated to us a saving of 20% in other words, we remove approximately 90% of the metal by sawing, after which the blocks are sent to the planer for finishing the shanks. The total elapsed time for the sawing and planing we have found to be 20% less than that required by planing alone. We should also like to point out that the pieces of stock removed by the sawing are useful in many ways and have eliminated the necessity of buying some of our trimmer steel.

Perhaps you also would be interested in our blade life and blade cost. We have found that with an original blade and having it reground twice, we are able to cut 2,000 square inches. The cost of the blade being as little as 10¢.

Trimming the worn impression from the face of a 20" x 24" die block with a No. 24 MARVEL Universal Hydraulic Roll Stroke Hack Sawing Machine. Average Blade Cost \$0.108 per square inch.

Write for Catalog of MARVEL Modern Metal Saws



ARMSTRONG-BLUM MFG. CO. 5700 W. BLOOMINGDALE AVE. CHICAGO, (39) U. S. A.



Warn of Skilled Worker Shrinkage

Tool and die spokesmen tell government supply of trained men is on the wane . . . Blame poor schooling programs, union restrictions for shortage . . . Cite danger to defense—By E. J. Egan, Jr.

♦ TOOL and die industry spokesmen told Business and Defense Services Administration and other government officials last week that the industry's two big headaches are a shortage of skilled craftsmen and loss of business resulting from defense order cutbacks.

Manufacturers stressed the manpower shortage as their most acute problem. They fear that contract tool and die shops might be woefully shorthanded if a sudden defense emergency should require a rapid production buildup.

They also said that regardless of emergencies, the flow of new apprentices must be stepped up. If present rates of entry and training are not increased, 25 years from now the industry will only have one-third the number of skilled workers it has today.

Blame Themselves . . . Tool and die shops assume some of the responsibility for negligence in recruiting and training apprentices. But shop owners also say that restrictive labor contracts in some areas choke the fresh manpower flow to a trickle.

Manufacturers cited the Detroit area as one example where labor contracts have had this limiting effect. Tool and die shops there once were allowed only one apprentice for every 15 journeymen.

Two years ago a new contract did cut this ratio to one for every eight but industry officials still consider this inadequate.

Ask Draft Help . . . To help meet immediate needs, industry spokesmen asked that present draft exemptions for trainees be

continued. To achieve long range manpower goals, conferees discussed a public relations program for high school students. Its object: to acquaint boys with the dignity and rewards of this skilled trade.

Much conference discussion centered on industry complaints that small tool and die shops often lose a disproportionate amount of business when prime contractors receive defense order cutbacks. Shop owners have no argument with the necessity for cutbacks. Nor will they dispute a customer's right to make his own tools and dies if he thinks he can do it better or for less cost.

Cut Too Much . . . But contract shops do object when prime defense contractors use order cutbacks as an excuse to cancel more tool and die work than the situation calls for. They also say that such cutbacks have served as use-

Continued on page 10



"Tell me, Bronski, just what is the secret of your department's fantastic rise in production?"

GEAR INDEX 1955



Base: 1947-49 = 100

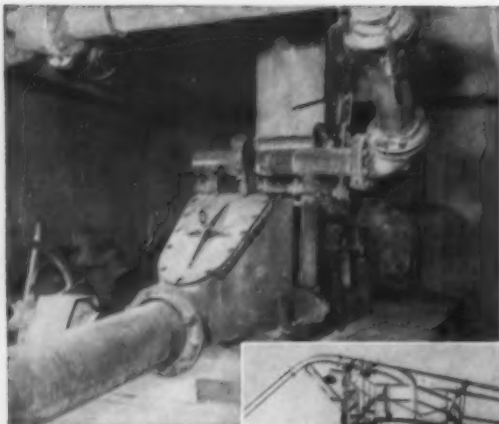
Source: American Gear Manufacturers Assn.

ful "smokescreens" for prime contractors who then set up their own tool and die making facilities with government-owned buildings and machine tools.

A Defense Dept. representative assured industry conferees that military procurement officials are aware of these problems. He said that plans are being made in an attempt to solve them. An Air Force spokesman also said that Defense Dept. policy does not authorize furnishing tool and die making facilities where private capacity is available to do the job.

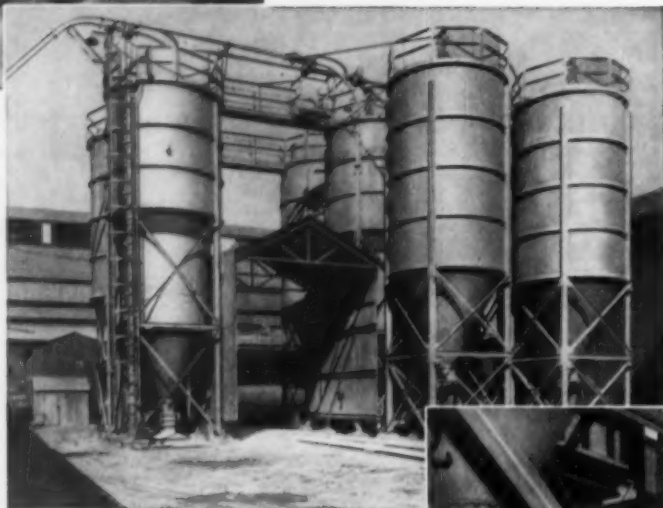
Bulletin F Out . . . Machine tool builders and users are pleased at the recent announcement by the Commissioner of Internal Revenue that Bulletin F is "out of date and outmoded." Bulletin F was for many years the official Internal Revenue Service yardstick for useful life of all machine tool types.

It is expected that a new useful life schedule in the form of a revised Bulletin F will be available within a year. The entire subject of useful life for machine tools is now open to more liberal interpretation as a result of rapid depreciation allowances permitted in the new tax laws.



Above: One of two Fuller-Kinyon Portable Pumps which convey either from cars to storage, or from storage to supply bins above mixers.

Fuller Air-Conveying System pays off for a steel foundry



Storage bins, conveying pipe lines from car unloading station to bins, and from bins to mixers.

Below: F-H Airslide from bin for discharge to pump.



General Steel Castings Corporation, Granite City, Illinois has greatly improved its handling of incoming sand ingredients by installing the Fuller-Kinyon Conveying System in conjunction with F-H Airslides.

Corn flour, silica flour, and bentonite, received in hopper-bottom cars, discharge direct to a Fuller-Kinyon Portable Pump, which conveys through pipe lines to a number of storage bins. Two such pumps, located in a tunnel, are mounted on trucks running on a narrow gage track for easy spotting under the cars or bins. The system is quite flexible—one pump is used mainly for unloading cars and delivering to storage, the other for reclaiming from storage for delivery to supply bins above mixers. Both pumps, however, can be used for either purpose. It is also possible to unload from cars and reclaim from storage simultaneously. Where bins are located so they cannot discharge directly to a pump, F-H Airslides convey to the pump.

Previous to the Fuller installation, materials were received in bags, manually unloaded, stored and transported to the mixers. These operations have all been eliminated, as well as waste and

dust from broken bags, together with release of bag-storage space for other uses. Also, there is an inherent saving when purchasing materials in bulk. All of this means clean, efficient materials handling, plus more dollars on the profit side of the ledger.

Fuller air-conveying systems are in operation in thousands of plants throughout industry, cutting costs and increasing profits, day in and day out. The next time you have a materials-handling problem, why not get in touch with Fuller . . . chances are you will also profit as so many others have.



FULLER COMPANY, Catasauqua, Pa.
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
Chicago • San Francisco • Los Angeles • Seattle • Birmingham

G-109
1479



The Iron Age

SALUTES

Frank L. LaQue He went down to the sea with a test tube and came up with the answer to corrosion problems that had been costing taxpayers millions and making Navy ships grow old before their time.

When Frank LaQue takes time off from his work in the summer, he goes sailing. Spends the whole vacation sailing in his native Canada.

There's nothing so unusual about this except that Frank's work for International Nickel has involved a running fight against oceans and salt water. Vice president and manager of development and research at INCO, he has been researching for 28 years on corrosion and corrosion resisting materials.

INCO's seaside testing stations at Kure Beach and Harbor Island, North Carolina, are his babies and highly productive ones they have been. Navy Admiral Logan McKee cites Frank's operations as "saving the taxpayers millions of dollars." In 1949 he received the F. N. Speller Award for achievement in the corrosion field.

Frank L. LaQue was born in Gananoque, Ont., and graduated from Queens University, Kingston, Ont., with a degree in engineering.

He went from college into research and development with INCO. In 1937 he became assistant director of technical service on mill products.

He remained in this post until 1940 when he took up development of ferrous and nonferrous alloys. He became head of the corrosion engineering section in 1945; was elected vice president last year.

Frank has written all kinds of papers and articles on corrosion. He is past president of the National Association of Corrosion Engineers. He is chairman of the advisory committee on corrosion of the American Society for Testing Metals.

He is a tireless worker, often sticking to his job until 10 at night and working right through a weekend. He is a very purposeful man but completely just and fair.

And Frank is one technical man who carries precision into his daily obligations. On more than one occasion he has started a lecture at the appointed hour and talked for several minutes to an empty house.

Frank lives in South Orange, N. J., and has a summer home in Gananoque. He is married; has two daughters, Mary and Katherine.

A completely new and different
PAYLOADER®
 TRACTOR SHOVEL

Powerful
 break-out
 digging action



Fast, efficient bucket-loading action of the new Model HA "PAYLOADER" begins when the machine moves forward and forces the 18 cu. ft. bucket into the pile with up to 3,100 pounds of push.



Twin, double-acting hydraulic rams, independent of the boom elevators, next rotate the bucket on its hinges . . . the cutting edge slices up through the pile in a powerful "break-out" digging action.



Bucket roll-back of 40° is now completed. The loaded bucket is close to the machine and low—only six inches off the ground—in a stable, sure position for safe, rapid transport at speeds up to 10 mph.

Your Hough Distributor is ready to demonstrate this completely new and different Model HA and what it can do.



PAYLOADER®

MANUFACTURED BY
 THE FRANK G. HOUGH CO. • LIBERTYVILLE, ILL.
SUBSIDIARY INTERNATIONAL HARVESTER COMPANY



THE FRANK G. HOUGH CO.

Send complete information on the 1955 Model HA "PAYLOADER"

NAME _____
 TITLE _____
 COMPANY _____
 STREET _____
 CITY _____ STATE _____

The Iron Age INTRODUCES

Charles J. Stillwell, elected chairman of the board of directors, **Warner & Swasey Co.**, Cleveland.

Victor F. Loerner, elected assistant secretary, **Mesta Machine Co.**, Pittsburgh.

W. C. Hillman, Jr., appointed manager, coke sales, **Pittsburgh Coke & Chemical Co.**, Pittsburgh.

Martin H. Olstad, elected vice-president, charge of engineering, **Niagara Blower Co.** **William M. Mosler** was named secretary.

A. H. Jackson, promoted to general manager, engineering and development department, **Blaw-Knox Co.**, Pittsburgh.

Ralph W. Bailey, appointed sales manager, continuous-cast products department, **American Smelting & Refining Co.**, New York.

John S. Davey, promoted to vice-president, **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y.

Ralph E. Hoover, joins **Standard Tube Co.**, Detroit, as assistant to the president.

W. M. Stephens, appointed acting superintendent of construction, **Texas Eastern Transmission Corp.**, Shreveport, La.

John DeKoven Alsop, elected a director, **Torrington Mfg. Co.**, Torrington, Conn.

J. H. Harris, appointed secretary and treasurer, **Weirton Steel Co.**, division of **National Steel Corp.** **Floyd T. Bowen**, named assistant treasurer of **National Steel**; **L. R. Naragon**, named assistant treasurer; **W. R. Schreiner**, promoted to comptroller.

Ivan R. Rebert, appointed superintendent, plant production planning department, **Kaiser Steel Corp.**, Fontana, Calif. **John W. Miller**, named to the Oakland office to manage product planning for the corporation.

Joel Burnette, appointed, foundry sales department, **C. O. Bartlett & Snow Co.**, Cleveland.

William C. McClaskey, Jr., named sales abrasive engineer, **Bay State Abrasive Products Co.**, Westboro, Mass.

Lawrence J. Koller, appointed director of research, **Pontiac Varnish Co.**, Pontiac, Mich.

J. W. Kepler, elected vice-president—sales, **Pittsburgh Consolidation Coal Co.**, Pittsburgh. **Joseph W. Oliver**, elected vice-president—public relations and personnel.

Eibe W. Deck, appointed vice-president, charge of production, and **Earl F. Riopelle**, appointed vice-president, charge of engineering and research for **Lukenheimer Co.**, Cincinnati.

S. L. Weaver, promoted to district manager, **Buffalo, Latrobe Steel Co.**

PERSONNEL



FLETCHER DEVIN, elected a vice-president, **The Cooper-Bessemer Corp.**, Mt. Vernon, O.



FLORAN L. MEACHAM, elected president and general manager, **Simonds Worden White Co.**, Dayton.



EDWARD C. BLOOMBERG, elected president, **Monarch Aluminum Mfg. Co.**, Cleveland.



CYRIL P. GAMBER, appointed comptroller, **Quaker Rubber Corp.**, Division of **H. K. Porter Co., Inc.**, Philadelphia.

April 7, 1955

Dunstan Graham, appointed, department head, flight controls systems, Grand Rapids Div., **Lear, Inc.**

Irwin D. Harris, elected chairman of the board, Rolled Steel Products Div., **Emergency Steel Service Corp.**, St. Louis.

E. E. Mayo, appointed vice-president, **Southern Pacific Pipe Lines, Inc.**, Houston.

Benjamin S. Labeka, promoted to supervisor of specifications and inquiries, Allenport, Pa., Sheet Mill Div., **Pittsburgh Steel Co.**

Paul B. Jessup, appointed secretary, **Kennecott Copper Corp.**, succeeding **Robert C. Sullivan** who moved to the legal department.

E. O. Mitchell, promoted to purchasing agent, **Chicago Pump Co.**, Chicago. **J. Zelenietz** becomes assistant purchasing agent.

A. M. Thomas, appointed director of sales, **Heller Brothers Co.**, Newcomerstown, O.

William K. Winstead, named southeastern district manager, **Walter Kidde & Co., Inc.**, Belleville, N. J.

Louis Srybnik, appointed director, special products division, **S & S Machinery Co.**, Brooklyn, N. Y.

Don L. Anderson, joined the sales staff of **Aro Equipment Corp.**, Bryan, O.

Jack J. Jarms, named welding positioner specialist, **Harnischfeger Corp.**, Milwaukee.

John G. Deutsch, appointed manager, western industrial division, **Atkins Saw Div., Borg-Warner Corp.**, Los Angeles. **James E. Good**, appointed central industrial division manager.



WILLIAM J. BUECHLING, appointed one of the Asst. General Superintendents, **Copperweld Co.**, Warren, O.



LAWRENCE F. BOLAND, named vice-president in charge of sales, **Beryllium Corp.**, Reading, Pa.



WILLIAM L. WOLFE, appointed vice-president, sales, **Jones & Laughlin Steel Corp.'s Supply Division**.



ORVAL W. RIGGS, elected vice-president in charge of sales, **The Hays Corp.**, Michigan City, Ind.



**"BEST \$1286 WE
EVER SPENT!"**

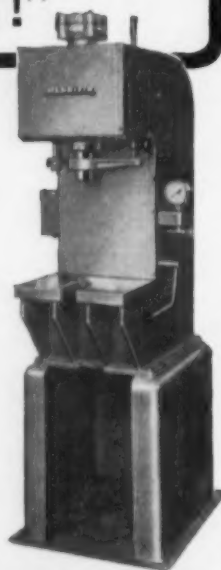
**That's the price of this
5-Ton HANNIFIN Press***

A lot of production men have made such comments about this versatile little hydraulic press.

They like the way you can adjust it to the exact force you need for each job, all the way from 1 ton to 5 tons. The backstroke is adjustable, too, so the ram just clears the work on any job. Fast-acting controls. Prompt delivery from stock.

WRITE. Complete information and prices on the Hannifin line of 1- to 10-ton Hydraulic Presses will be sent on request.

*Price complete with motor and starter F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



HANNIFIN

Hannifin Corporation, 513 S. Welf Road, Des Plaines, Illinois

Announcing The New **UNIT** Model 510 *Challenger*



DESIGNED with a BACKGROUND of $\frac{3}{8}$ YARD EXPERIENCE

Evidence of highest quality engineering and construction includes alloy steels and forgings • anti-friction bearings • modern transmission design with involute splines to add strength and reduce wear • straight-in-line engine mounting with torque converter • trunnion supported tapered drums to eliminate bending stress on drive shafts • easily accessible hydraulic clutches • minimum number of main machinery gears enclosed in one-piece cast gear case • force feed lubrication • self-aligning replaceable hook shoes distribute applied pressure over maximum area • interchangeability of parts simplifies maintenance, cuts costs. All these UNIT advantages mean more profitable operations for you.

Why it's **BEST** to INVEST in modern **UNIT** models

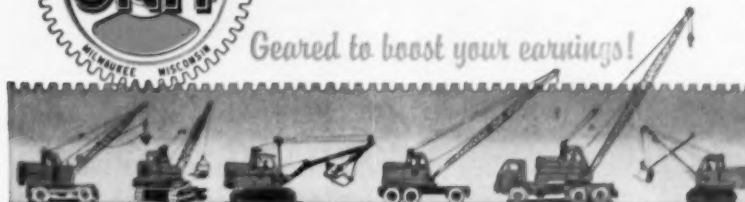
Because each feature has been proven to contribute substantially to the Life, Performance and Efficiency which have made present and previous UNIT products readily acceptable.



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Please send me your new Bulletin on
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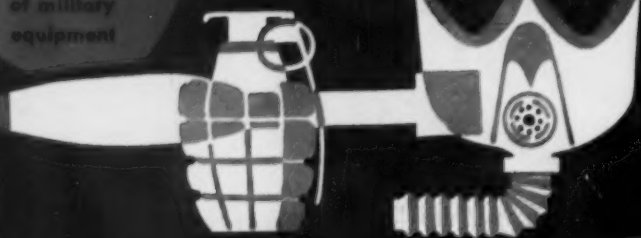
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A 8502-IPC

April 7, 1955

113

a special message
for manufacturers
of military
equipment



need a finish to beat these specs?

specify **IRIDITE**

AN-C-170 MIL-S5002 MIL-C-5541 AN-P32
AMS-2402A USA-50-80-11A J.Q.D. No. 144B
USA 57-93-2A O.S. No. 1374 USA 57-0-2C AN-P61
A-XS-1607 QQ-P-416 QQ-Z-325 MIL-3151—
if you're finishing under these or similar specifications,
here's how you can use Iridite:

ON ZINC AND CADMIUM you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

ON COPPER... Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

ON ALUMINUM Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

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Manufacturers of Iridite Finishes for Corrosion Protection and
Paint Systems for Non-Ferrous Metals, ARP Plating Chemicals,
WATER COAST INDUSTRIES, A. R. Bickel Co.



PERSONNEL

Oliver W. Jokerst, becomes sales manager, St. Louis, for the National Gypsum Co.

Walker A. Messick, promoted to manager of manufacturing engineering, Servel, Inc., Evansville, Ind.

E. Ross Houston, appointed district manager, Minneapolis, Revere Copper & Brass, Inc.

Lewis H. Dietz, named Western sales director, Thermobloc Div., Prat-Daniel Corp.

Perry R. Roehm, appointed a vice - president, Norden - Ketay Corp., New York.

Edwin R. Broden, elected executive vice-president, SKF Industries, Inc., Philadelphia.

Fred R. Brown, appointed district sales representative, McBeth Machinery Co., Pittsburgh.

Dr. Frederick H. Roberts, appointed director of research, Bakelite Co., New York.

OBITUARIES

Louis Abrams, 70, Louis Abrams & Son, scrap metal firm, Asbury Park, N. J. Mr. Abrams was the founder of the company 45 years ago.

Leo F. Supple, 65, sales manager, Standard Rolling Mills Div., Revere Copper & Brass Inc., Brooklyn, recently in Chicago.

Victor H. Spohn, 59, president, Victor Steel Co., Euclid, O. Mr. Spohn had been in the steel warehousing business since 1917.

Elton Hoyt II, 66, managing partner of Pickands Mather & Co., recently in Cleveland.

Charles Binks, 67, vice-president, Mooney Iron Works, Co., Cleveland, recently of a heart ailment.

Lasts Longer!

SURVEY

DESCRIPTION OF WORK

Snagging fins and risers from cast-iron pipe fittings

WHEEL

Simonds 24 x 2½ x 12 wheel with Reinforcing Flanges

PERFORMANCE

Good cutting action: no dressing needed.
Gave 1/3 to 1/2 longer life than competitive wheels.

SIMONDS
ABRASIVE CO.

SNAGGING WHEELS

WITH REINFORCING FLANGES

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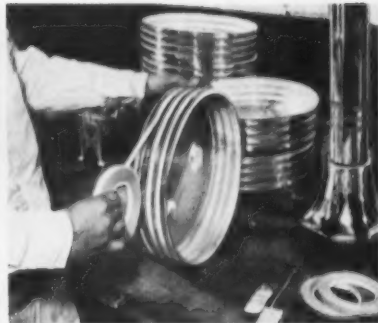
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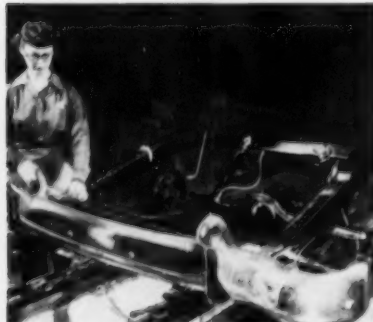
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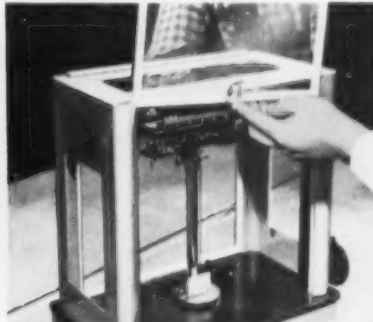
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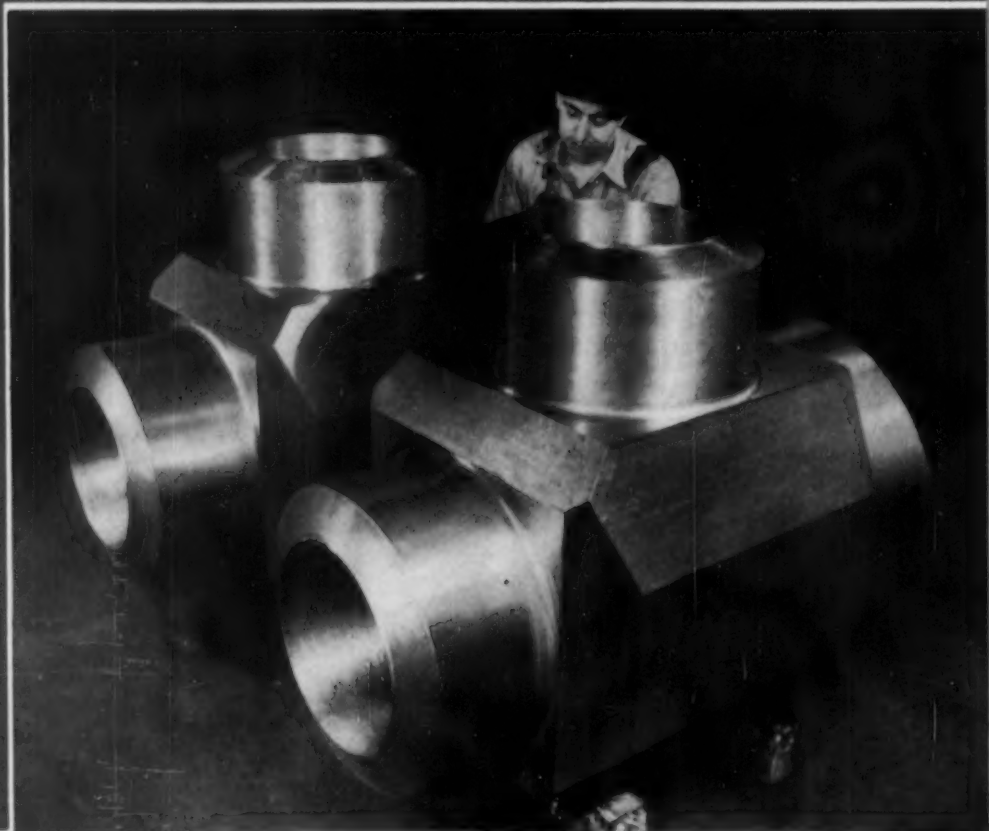
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Ferritic and austenitic grades—

How Stainless Steels Rate for High Temperature Aircraft Service

Part I

♦ Some stainless alloys exhibit the high-temperature properties required for use in today's high-speed aircraft . . . One is a modification of AISI 420 and another is a specially developed austenitic grade.

♦ The ferritic grade, 422M, not only possesses better strength at 1000° to 1100°F, but also has a lower coefficient of expansion than the austenitic grades . . . Crucible HNM, an austenitic grade not prone to overaging, has excellent strength values between 900° and 1300°F and very low magnetic permeability.

By E. A. LORIA, Staff Metallurgist,
Crucible Steel Co. of America,
Pittsburgh

This article is the first of a two-part series. The second, which will appear in next week's issue of The Iron Age, will discuss the chromium alloy steels.

♦ AERODYNAMIC HEATING of aircraft surfaces is a serious problem in high-speed flight. Improved materials are one avenue of approach to structural stability in the construction of aircraft subject to extended kinetic heating.

The structural problem can best be visualized by examining the materials now used or contemplated for aircraft construction. Fig. 1 compares several structural materials on a strength-density ratio for various temperatures.

The upper limit of use for the presently available titanium alloys at sustained temperatures is about 700°F. This limit is imposed, not by the reduction in tensile properties with temperature, but by the lowering of the creep properties. Above 700°F, stainless steel and cobalt base alloys seem to be the most promising materials. Even for these materials, the upper limit will be about 1400°F owing to rapid decrease in creep properties at this temperature.

At present speeds into the sonic zone, frictional heat on the aircraft surface, caused by high rates of air flow, is crowding the safe limit curves of the low alloy materials. Nevertheless, the next step will be for longer duration at still higher speeds; instead of minutes at speeds creating heats of 200° to 300°F, design criteria will call for hours at speeds cre-

TABLE I

Chemical
Composition

Grade	C	Mn	Si	Ni	Cr	V	W	Mo	P
422	0.23	0.87	0.14	0.70	13.2	0.25	1.02	1.01	
422M	0.28	0.84	0.24	0.20	11.8	0.49	1.72	2.24	
HNH	0.30	3.50	0.50	9.50	18.5				0.25

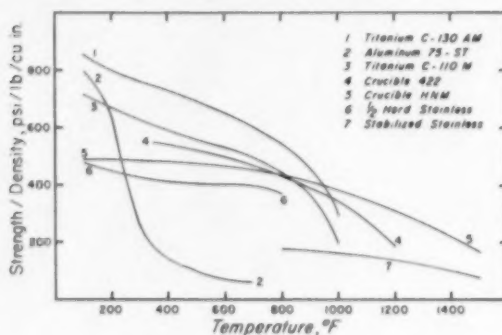
ating heats of 600°F and above. Improved steels merit attention in these applications.

The requirements of steel subject to prolonged aerodynamic heating to high temperatures are: (1) High heat treated properties at room temperature. (2) Retention of a high percentage of these properties on extended high temperature service. (3) Corrosion resistance, or easy protection by a simplified process. (4) Little or no distortion during heat treatment. (5) Good fabrication and welding characteristics. The higher strength of steel will give rise to thinner gages and sections being used. Consequently, new fabricating techniques will be necessary.

The common steels, AISI 8740, 4130, and 4340, which are in limited use in today's air-

Below: FIG. 1—Structural metals compared on a strength-density ratio at elevated temperatures.

Right: FIG. 2—Thermal expansion curves for ferritic and austenitic stainless grades.



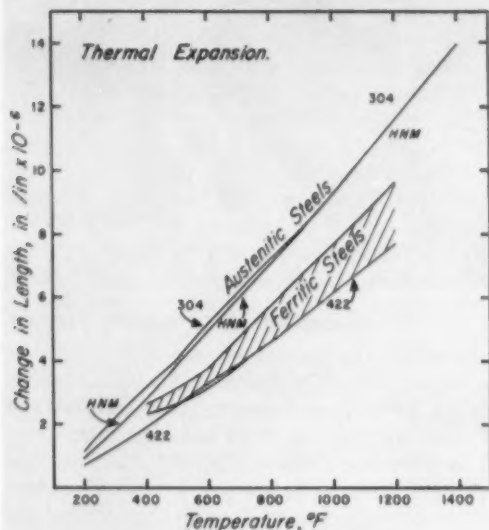
craft, fall short of these requirements above 400°F. These steels lose their useful, heat treated room temperature strength very rapidly over 400°F. They are all very susceptible to corrosion, especially when exposed to heat, and because of the required quenching operation, they distort during heat treatment. The only requirement they do meet is the ease of fabrication and weldability characteristics.

The currently available AISI 400-series steels are, as a general classification, well known to other industries. These steels retain high room-temperature, heat-treated properties up to about 800°F before embrittlement takes over. Although classified as stainless, surfaces require polishing to meet this specification.

An improved modification of AISI 420 is

TABLE II Properties of Crucible 422 at Elevated Temperature

Test Temp., °F	Tensile, psi	0.2 pct Yield, psi	Elongation, pct	Reduction in Area, pct	Charpy Impact, ft-lb.
TEMPERED AT 800 °F—Rc 47					
400	227,000	160,000	12	43	38
600	237,000	145,000	13	27	34
800	223,000	140,000	15	32	28
TEMPERED AT 1100 °F—Rc 36					
400	151,000	125,000	16	52	53
600	141,000	120,000	12	47	54
800	121,000	100,000	14	52	54
TEMPERED AT 1200 °F—Rc 33					
1000	96,000	82,000	25	67	38
1200	52,000	45,000	30	83	



Crucible 422. Chemical composition is shown in Table I. This ferritic stainless grade has been proven suitable for service around 1000°F where its strength properties compare favorably with austenitic stainless.¹

Another advantage can be found in the influence of temperature on linear thermal expansion, Fig. 2. The ferritic steels have a lower coefficient of expansion than the austenitic steels. The low value of 422 is noteworthy and consequently it merits consideration in air-frame construction. Stress induced by thermal expansion presents a problem which would not exist if materials could be developed which have a sufficiently low coefficient of thermal expansion.

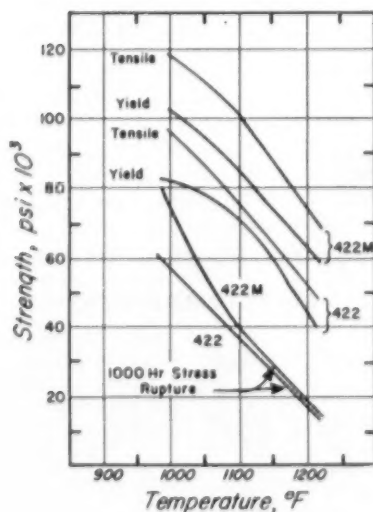


FIG. 3—Strength at elevated temperatures of Crucible 422 and 422 Modified. Oil quenched from 1900°F and tempered at 1200°F.

The elevated temperature tensile and V-notch impact properties of 422 and modified 422 are given in Tables II and III. The latter is similar in characteristics but possessing appreciably better elevated temperature strength. Fig. 3 shows both grades are satisfactory for service at 1000° and 1100°F. Of course, tempering temperature has a measurable effect on the elevated tensile and stress rupture strength of these alloys. The elevated temperature tensile test and the master tempering curve can be used advantageously in selecting superior ferritic steels.

Creep and structural stability

The master tempering curve for 422 has a flat portion at around Rc 33 (between parameters of 32600 and 35000) and the high degree of structural stability which is conducive to good properties is attributed to this flat portion of the master tempering curve.^{1, 2} Creep properties evaluate structural stability but there are few data available for temperatures below 850°F. The little information available indicates that at 500° to 700°F, the stress required to produce 0.1 pct creep strain in 1000 hours is about two-thirds the yield strength of the steel. If such a stress were applied continuously at elevated temperature, creep strength would have to be taken into account.

Generally creep strength of austenitic stainless grades is superior to that of ferritic stainless grades above 1000°F. Consequently, for such service, the austenitic steels will gain favor and new steel will be of the precipitation variety. Crucible HNM is an austenitic stainless specifically developed for parts requiring high strength and very low magnetic perme-

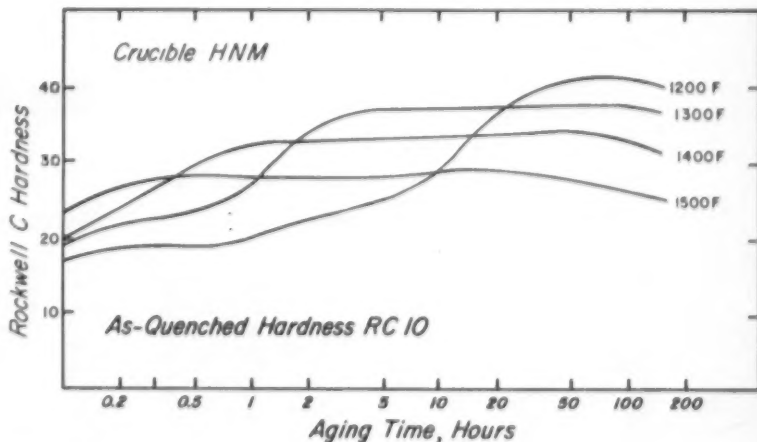


FIG. 4—Effect of aging time and temperature on Crucible HNM solution treated at 2050°F.

ability. It is a precipitation hardening alloy which is not prone to overaging.

For the best combination of mechanical properties, aging at 1350°F for 16 hours, following an oil quench from 2050°F, is recommended. However, varying aging temperatures and holding times will produce higher tensile and yield strength at some sacrifice in ductility. This grade is supplied in the solution treated condition, to a hardness of Bhn 201 maximum. Annealing and solution treatment can be accomplished by heating in the range of 2000° to 2150°F, holding for a minimum of 30 minutes and followed by an oil quench. Sections less than 5/8 in. thick may be air cooled.

The elevated temperature tensile properties for HNM are given in Table IV. The excellent values for service temperatures between 900° and 1300°F are evident. HNM has a higher yield and tensile strength than 422 at 1000°F. The density of HNM is 0.284 lb per cu in., while the density for 422 and the modified 422 is 0.280 lb per cu in. The comparison of their strength-density ratios at various temperatures with other materials is shown in Fig. 1.

In the temperature range of 200° to 800°F, strength-density ratios of austenitic HNM are below those for the two titanium alloys but above those for the ordinary stainless grades. Above 800°F, the marked superiority of HNM over other materials is evident. The strength-density ratios are far better than for the ordinary stabilized stainless grades. In the 200° to 800°F range, the strength-density ratios of the ferritic 422 are better than austenitic stainless and are close to those obtained for one of the titanium alloys. Above 900°F, the 422 alloy occupies a position intermediate to HNM and conventional austenitic stainless.

Another way of showing the structural stability of HNM is in the effect of aging time and temperature on the precipitation hardening

characteristics after a solution treatment, Fig. 4. A limited amount of stress rupture data for HNM at service temperatures of 1200° and 1350°F has been obtained. The stress to rupture in 100 hours at 1200°F is 50,000 psi and at 1350°F is 28,000 psi for specimens solution treated at 2000°F and aged at 1400°F. A higher solution temperature results in longer rupture life but ductility is decreased.

Annealed HNM readily formed

In HNM, the compound responsible for the hardening, $Cr_{23}C_6$, is retained in solution during cooling from the solution treating temperature at rates as slow as those at the center of a 10 in. diam bar quenched in oil.³ Thus, during subsequent reheating for aging, this compound can be precipitated uniformly throughout the section. HNM can be formed readily in the annealed condition and can then be hardened by heating at 1350°F.

As hardened, HNM has the usual stainless room temperature properties. However, when compared to stainless grades hardened by martensite formation, its strength properties become superior as the service temperature increases. For example, an age-hardened austenitic structure is superior to a tempered martensite structure in that it will not overage at 1000°F and above and hence will be stronger at such elevated temperatures.

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TABLE III

Properties of Crucible 422M at Elevated Temperature

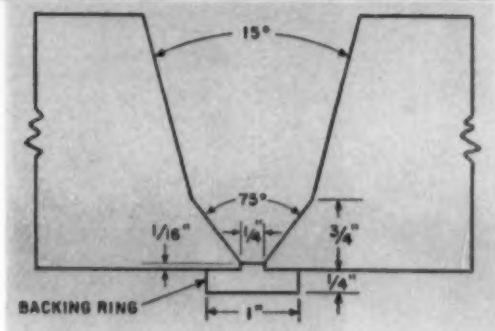
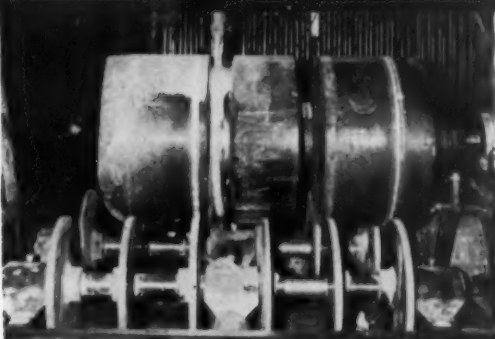
Test Temp., °F	Tensile, psi	0.2 pct Yield, psi	Elongation, pct	Reduction in Area, pct	Charpy Impact, ft-lb.
TEMPERED AT 800 °F—Rc 50					
400	253,000	180,000	11	36	27
600	252,000	155,000	13	37	34
800	238,000	140,000	12	26	23
TEMPERED AT 1100 °F—Rc 43					
600	185,000	150,000	12	46	44
800	172,000	140,000	15	50	42

TABLE IV

Tensile Properties of Crucible HNM at Elevated Temperature

Test Temp., °F	Tensile, psi	0.2 pct Yield, psi	Elongation, pct	Reduction in Area, pct
80	166,000	124,000	19.5	31.5
600	133,000	101,000	15.0	28.0
900	117,000	90,000	13.5	33.0
1200	89,000	80,000	19.0	38.5
1350	69,000	65,000	14.5	25.0
1500	49,000	46,000	4.0	16.5

(2050 °F 1/2 hour, oil quenched; 1350 °F 16 hours, air cooled. Room temperature, Rc 38.



Double angle V joint—

Thick-Walled Welded Vessels Pass Rigid X-ray, Pressure Tests

♦ **SOUND WELD JOINT** design and precisely controlled welding techniques recently enabled a number of heavy-walled pressure vessels to pass 100 pct X-ray inspection and withstand 27,000 psi test pressures. Fabrication was done economically by the Cameron Iron Works, Houston, Texas, using high-speed Unionmelt welding.

The largest pressure vessel was made from three sections of forged 1029 steel. This assembly measured 44 $\frac{3}{4}$ in. in length by 24 in. in diam. Inside diameter was 9 in. with a wall thickness of 7 $\frac{1}{2}$ in.

Linde service engineers and Cameron's welding experts worked out welding conditions and a weld joint design for the job. Result was the double angle V joint illustrated. From the 1/16-in. nose a 37 $\frac{1}{2}$ ° bevel rises to a level $\frac{3}{4}$ in. above the inside diameter. The remaining bevel of 7 $\frac{1}{2}$ ° extends to the outside diameter. A backing ring, 1 in. wide, 3/16 in. thick, and with a 1/16 in. by $\frac{1}{4}$ in. shoulder is inserted for fit-up purposes and held by tack welds.

The weld area was preheated to 400-500° F. Then, the Unionmelt DSH welding head shown above was positioned and the operation started. Two hundred and sixty-five lb of weld metal were deposited in the two joints in 800 passes. Each pass was visually inspected to insure a clean weld, free from porosity and cracks. Due to precise control, no cracking took place at the weld joints.

The first welding pass, which had to be completely welded to the backing ring, was put in at 475 amps and 28 v, using $\frac{1}{8}$ in. Oxweld No. 40 welding wire. Wire size was changed to 5/32 in. and the current gradually increased to 700 amps and 34 v for the fourth and succeeding passes. Welding speed was 18-20 in. per minute. Grade 80, 20 x 200 Unionmelt composition was used throughout.

After welding, the vessel was stress-relieved and welds were ground or machined flush with the outside diameter. Inside finishing was not necessary.

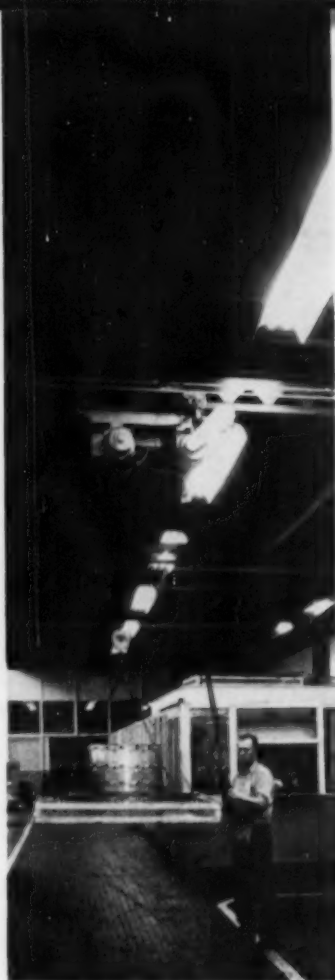
Serves 1/2 million sq ft—

Multi-Purpose Overhead Handling System Features Full Floor Coverage

♦ There's plenty of materials handling in a jet engine plant that covers almost 53 acres of floor space . . . These photos show how an overhead monorail-hoist system serves many shop areas with speed and safety.



▲ **MONORAIL** system combines speed with safety in processing work through pickling tanks. Aided by the pendant-controlled hoist, entire cycle through tanks takes only 45 min.



SPARE combustion chamber for a jet engine is crane-hoisted for a preservative dip.

♦ **IT TAKES A BIG** and flexible overhead materials handling system to serve almost a half million sq ft of floor space at the Kansas City, Mo., plant of Westinghouse Electric Corp.'s Aviation Gas Turbine Div.

Careful advance planning went into the installation of the Trambeam Crane and Monorail carriers supplied by Whiting Corp., Harvey, Ill. These units provide speed and precision for handling jet engines and components. The versatile overhead system also increases manpower productivity, and allows full utilization of production areas.

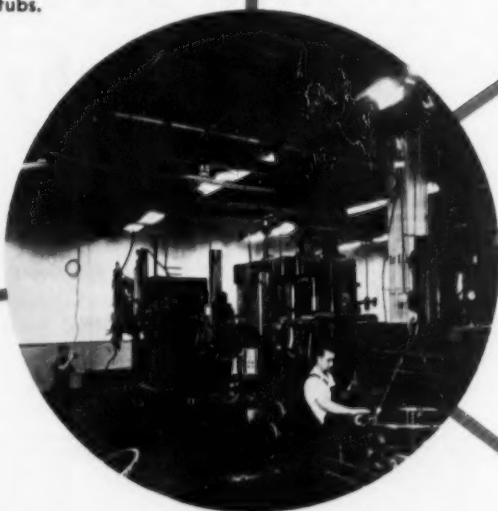
In many cases an overhead track permits one hoist to serve a number of machines. Using push button pendant controls, a machine operator can lift heavy parts on his machine quickly and easily. The hoist is then available for use at adjoining equipment.



▲ A T-BEAM monorail system with a manually-operated switch serves a row of tumbling mills in the blade diaphragm shop. Hoist handles mills in and out of processing tubs.



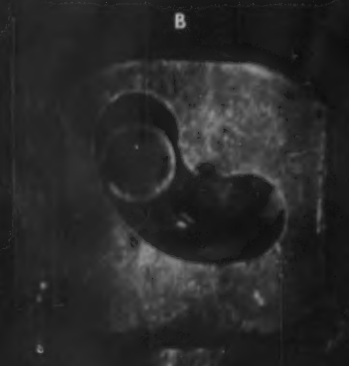
▼ HEAT treating and pickling department uses a 2-ton combination crane and monorail system (with one switch and a fixed transfer section) to move parts through processing and also serve storage needs in this area. Installation allows complete floor space coverage.



▲ ONE-TON hoist and monorail system serve three vertical turret lathes in the fabricating shop. Monorail track arrangement provides for fast hoist and load movement without interfering with machine controls. Hoist travels onto machine's hand-pushed 4-wheel carrier.

▼ AFTER final assembly, jet engines are packed in these metal containers for shipment or storage. This "canned" engine is being crane-hoisted for shipment loading.





A
CRACK at top of plunger slot persisted despite revised steel composition and heat treatment.

B
HIGH speed movies showed that drive pin travel did not carry to top of plunger slot.

C
PLUNGER strengthened with 30 pct more metal at top of slot. No cracks. Case closed.

Equipment, processing, design—

Expand Applications of High Speed Photography

By H. P. KRAGIEL

Chemist-Photographer
The Stanley Works
New Britain, Conn.

♦ Alert managements constantly find new applications for high speed photography . . . The technique is most commonly used to pinpoint troubles in rapid motion machines and processes.

♦ The Stanley Works also uses its high speed photo equipment to train its tool engineers . . .

And product designers study slow motion pictures to improve hardware items.

**Equipment and technicians
are readily available to the com-
pany's divisions . . .**

♦ **HIGH SPEED** industrial photography is being used to (1) detect sources of trouble in fast moving processes and machinery, (2) train tool engineers, and (3) aid product design and development at The Stanley Works, New Britain, Conn. Camera equipment and technicians are readily available in the firm's laboratory to supply this cost reduction and product improvement service to the company's several divisions.

A recent trouble-shooting experience involved a machine which packages a counted number of wood screws at the rate of 75 packages per minute.

The machine suddenly started producing packages containing an incorrect number of screws. After several expensive days of "down" time, during which mechanics labored over the equipment without success, high speed photographs were suggested.

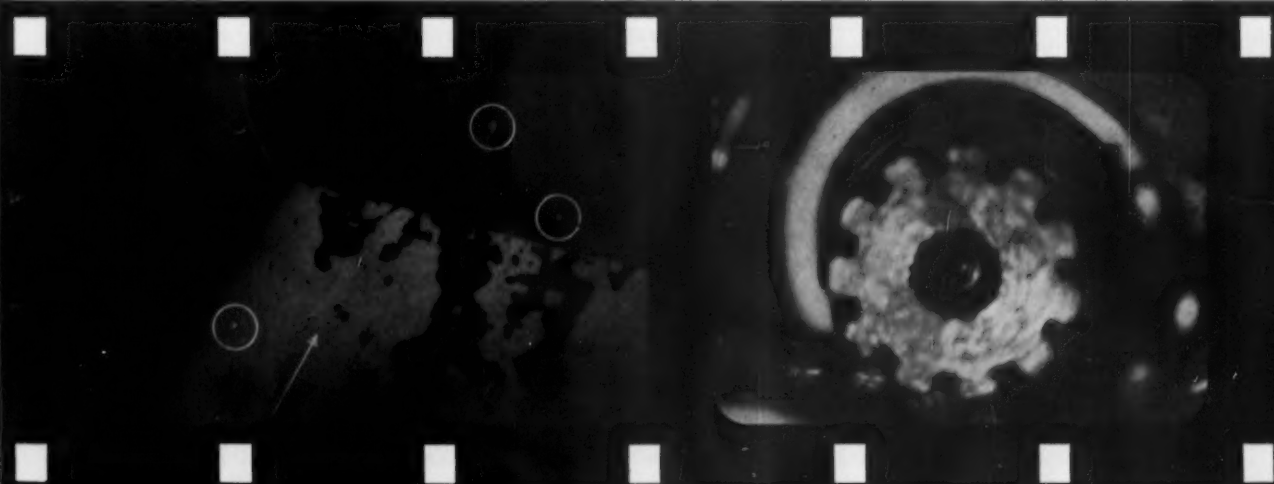
PRINT, enlarged from film, "caught" mill scale particles (circled) falling on steel strip surface in hot rolling mill. Problem was remedied by screening the cooling water.

Projection of the resulting pictures, which slowed the original action 50 times, immediately revealed the source of trouble. The entire system of cams and gear drives in the machine was seen to hesitate momentarily and sometimes stop altogether. This occurred in each cycle of operation whenever a certain additional load was suddenly brought into the system.

This faulty action suggested a momentary loss in power such as might be caused by a worn drive belt or worn bearings. As a result of the picture study, two bearings and a drive belt were replaced. This eliminated the difficulty and the machine returned to trouble-free production immediately.

Another trouble-shooting job for the high speed camera concerned a machine that prints inch graduations on both sides of painted wood sticks, which are later assembled into the well-known Stanley "Zig-Zag" rule. The printing

GEAR drive behind 20,000 rpm circular saw blade is detailed by high speed movie.



Fifteen dollars for film and a half-day's time saved the equivalent of \$6000 per year . . .

ink on these sticks remains wet for some time, requiring a machine racking operation to prevent smudging. Seven per cent of the sticks printed by this particular machine became useless scrap when they failed to seat properly in the drying rack and fell to the floor.

This represented a substantial loss both in money and natural resources because the select maple wood must be grown and harvested, then sawed, planed, trimmed, bevelled, inspected, tumbled and painted before the printing is done.

But the blur of motion which resulted as the printed sticks were fed into drying racks at the rate of three every two seconds prevented simple visual examination. The problem remained unsolved until high speed photography was applied. The solution, in simple arithmetic: \$15 worth of film plus a half-day's time. This was equivalent to saving \$6,000 per year—enough to pay for three high speed cameras.

The company recently solved a perplexing metallurgical problem with the aid of high speed motion pictures. The Electric Tools Div. manufactures an electrically-driven hammer which derives its rapid hammering motion (40 cycles per second) from the reciprocating action of a steel plunger. During the product development period these plungers cracked with distressing frequency. The crack always occurred in the same place, at the upper end of a certain curved slot in which a drive pin traveled.

Movies locate causes

In an effort to eliminate the cracking, the heat treatment for the plunger was changed but without success. Analysis of the steel was also changed but the cracking continued.

When the high speed motion picture camera was assigned to the problem, the results were surprising. Photographs taken at 3000 frames per second showed that the drive pin was not using the full slot length for its travel. Slot length was shortened, thereby increasing the plunger cross-section where strength was most needed. This promptly eliminated all cracking failures.

Another example of the high speed camera's utility occurred on a trouble-shooting job in the plant's steel strip mill. Particles of hard mill scale were being rolled into the steel, causing surface imperfections.

Clouds of steam virtually obliterated the suspected trouble zone from human vision. But a high speed camera was set up just 5 ft from

the 1800°F steel strip as it traveled at 7 ft per second.

The projected film confirmed the source of the difficulty and a screen was installed to remove scale particles from the cooling water. The remedy effectively reduced the amount of surface defects from this cause.

The use of high speed photography in product development has favorably influenced the design and performance of new and improved items. This is especially true in Stanley's Hardware Div., which designs and manufactures specialized hardware (hinges, latches, etc.) for many well known refrigerators.

It is not generally realized how much action occurs within a latch as a refrigerator door is opened or closed. Coil springs compress or expand; levers, plungers, strike—all move within a fraction of a second. The unaided eye cannot follow this action.

Now, with high speed photography, the short-time interval required to latch a refrigerator door can be stretched to cover a full minute of observation. Observers see motions they never believed to exist and equally surprised not to see actions that they expected to find.

Engineers study models

Stanley engineers achieve excellent performance in such production hardware items by making high speed motion studies of early models. Their design thinking is constantly revised as they gain new knowledge from such studies.

High speed photography is extended to serve educational purposes, too. One of the manufacturing superintendents ordered a high speed film study of a blanking and forming operation which used a ten-stage progressive die. Because the die setup performed so remarkably well, the slow motion projection serves as an excellent reference guide for tool designers.

In addition to slowing machine and process motion for visual examination, the company also determines the velocity of rapidly moving objects with its high speed camera. The necessary equipment is built right into the instrument. A light beam from a timing lamp flashes 120 times per second as the film moves through the camera, registering itself as a light streak along the edge of the film.

When the number of picture frames between the starting points of two successive light streaks is multiplied by 120, the product equals the "taking" speed of that portion of film, in frames per second. To measure the velocity of a moving subject, it is necessary to know this frame-per-second film speed, and also the distance per frame over which the subject moved. A scale inserted in the photo field will measure this subject movement distance.

Such film studies, even of common hammer blows, could conceivably lead to practical improvements in hammer making and performance.

Air Gaging Proves Economical For Short Run Parts

- ♦ Air gaging can be profitably applied to short run part production . . . Benefits include fewer rejects, better assembly and repair part fits.
- ♦ Gisholt Machine Co. recently installed air gages on grinders, boring mills and superfinishing equipment . . . They are used to gage part tolerances of 0.0007 in. and less.

By C. K. SWAFFORD, Vice-President and Works Manager
Gisholt Machine Co., Madison, Wis.

♦ BY USING AIR GAGES to check close tolerance work on small lots of precision parts, the Gisholt Machine Co. (1) Keeps rejects to a minimum, (2) simplifies assembly problems, and (3) provides better incentive earning potential to the machine tool operators. Actual and indicated potential savings after a years' experience proves that air gaging installation costs were completely justified.

Accurately finished components for the firm's line of metalworking lathes, superfinishing machines and balancing equipment are made in short run lots. Shop orders usually call for one, two or a dozen pieces—seldom more than 20 at a time.

Until about a year ago, the company's machine tool operators and inspection personnel checked part dimensions with conventional micrometers, plug and ring gages, various dial indicators, etc. Quality was rigidly maintained in the firm's finished products, but often at a cost penalty. This was especially true when parts would unavoidably be processed all the

way to final inspection or assembly before causes for rejection became evident.

The situation clearly indicated a need for better in-process gaging, preferably with instruments that did not (1) require a practiced "feel" for accuracy; (2) have moving parts or surfaces that might wear or become sticky and dirty to the point of doubtful results.

Company engineers carefully studied the entire precision gaging field. Their conclusions favored a trial of the flow-type air gage because of its accurate, magnified comparison of work-piece-to-master dimensions.

In addition to their accuracy, such air gages are virtually foolproof and can be quickly and easily calibrated for flexibility on short run job changes.

Nine of these air gaging units were ordered from the Sheffield Corp., Dayton, Ohio, as a trial lot. They were permanently mounted on a group of internal, external and universal grinders where short run parts were customarily finished to tolerance spreads of 0.0007 in. and less.



AIR snaps, 5-column unit and reference discs mounted on an external grinder to gage short runs.



GEAR department grinders are equipped with one- and two-column air gaging units.

The experiment was completely successful. Out-of-tolerance rejects dropped to almost zero, and acceptable parts were finished so precisely to established tolerances that custom-fitting in final assembly departments was reduced to a minimum. New orders were promptly placed to bring the total number of air gaging units to 50.

Of the 50-unit total, 37 are installed on various grinders, honing machines, Super-finishers and boring mills. The final inspection department, gage stockroom and gear checking department have one unit each. The remaining 10 instruments are mounted on portable inspection carts or "tolerance trucks." These roam the machining departments to check work on machines not permanently equipped with air gages, thereby expanding the use and flexibility of this equipment.

Benefits from this wholesale switch to air gaging have proven the advisability of the changeover. One of the most encouraging results was the understanding, cooperation and enthusiasm exhibited by shop employees at all levels.

Employees well informed

Because these employee attitudes were essential to the program's success, all shop personnel were thoroughly trained in air gaging theory and its practical applications. Machine operators understood that the bulk of in-process gaging and instrument re-calibration for each job change would be up to them. They also realized that insofar as this practice helped them to increase their output of acceptable work, their incentive earnings potential would also increase.

But the major benefits of fewer rejects, together with consistently accurate parts and easier final assembly, stem from the numerous

ways in which Gisholt puts air gaging to use.

The basic Sheffield unit, as it is permanently fastened to a machine tool, consists of (1) an air filter, (2) a pressure regulator, (3) one or more internally tapered glass tubes in which the vertical motion of small float indicators compare workpiece dimensions to those of a master reference.

Air units calibrate quickly

Adapting the basic indicator units to a variety of gaging jobs is simply a matter of connecting the proper gaging head to the air flow circuit. In general, the air flow rate through orifices in the gaging head is diminished by a tight gage-to-workpiece fit and increased by a loose fit. These flow rate changes are immediately reflected in a fall or rise of the float in the glass tube.

For quick and unmistakably accurate measurements on external diameters, "air snap" gages are connected to the air column indicators. The gages are stocked in standard 1-in. increasing gap sizes up to a 12-in. maximum. For setting the "air snaps" to the correct gap opening, the company uses accurate sets of plug gages which were salvaged when gaging techniques were changed.

The experience one grinder operator had in air gaging an external diameter was quite common in the early days of the program. Natural curiosity led this operator to do what others had done: check his indicated air column dimension with his hand micrometer. In this case a persistent 0.0001-in. taper on a small shaft showed up very clearly on the magnified air gage scale. When no amount of fussing with the micrometer could detect the taper, the operator was completely convinced as to the air gage's accuracy.

Internal diameters are also air-gaged quickly



INTERNAL grinder operator air gages a worm wheel having an ID tolerance of 0.0005 in.



PORTABLE double column unit was wheeled over to boring mill to gage a master crankshaft.

and accurately by (1) fixed-diameter "air spindles" which resemble plug gages, or (2) adjustable bore gages. The "air spindles" gage smoothly finished bores of exact sizes in ranges of 1/16-in. steps: from a 5/16-in. minimum diam. to a 3-in. maximum. Gisholt's inspection department devised unique wooden boxes to protect these spindles and their matching high and low reference rings from dirt or damage.

Metric, odd-sized and tool-marked internal diameters up to a 3-in. maximum are accurately air-measured with an adjustable, "ball jet" type of gaging head. The carbide ball jets give a clear picture of tiny bore irregularities by point-to-point readings rather than an indicated average diameter over a small, smooth area.

Still another type of adjustable air bore gage is used for measuring internal diameters from 3 to 12 in. The gaging head is an easily calibrated, self-centering unit with all contact surfaces made of tungsten carbide. It requires only a slight rocking in the bore to indicate a true diameter.

Any of these internal diameter air gages instantly detect even the slightest out of round condition. Former techniques, despite precautions, often did not reveal these irregularities until parts failed to fit properly in final assembly.

Another benefit of air gaging accuracy is its ability to spot machine tools in need of repair or adjustment. Prompt attention to these machine faults keeps downtime and repair costs at a minimum.

While it is true that air gaging enables the company's machine shop to produce short-run parts to close and more certain dimensions, the technique has also permitted some helpful tolerance liberalizations due to consistent intolerance production. Since close fits are now possible without specifying tightly compen-

sating tolerances on matching parts, engineering drawings are steadily being revised to take advantage of minimized deviations in machining accuracy.

A constant flow of helpful suggestions from machine operators, inspectors and shop foremen is another tangible benefit the company derives from its air gaging setup. One of these led to the design and development of a micrometer thumbscrew attachment which is now standard on all of Gisholt's "air snaps." The unique device greatly simplifies and expedites setting anvils to reference diameters.

Design special gages

The same enthusiastic and cooperative employee attitude prompted a crude sketch that results in a Gisholt design for a special "bore size approach" gage. This instrument indicates when a bored hole approaches size closely enough to accept the final air bore gage without damaging it or causing it to wear.

Checking gear tooth spacing in final inspection is also much simpler because of a special qualifying type of air gage devised by Gisholt's chief inspector. The instrument requires no special operator skill although it works with unfailing accuracy to narrow possible sources of error to just two gear teeth. A conventional instrument can then quickly detect the faulty tooth.

Company management is certain that important customer benefits are inevitable due to this complete air gaging installation. Main reason is that accurate original components delivered to final assembly now require a minimum of hand fitting techniques to insure perfect fits throughout. And the same air gage accuracy applied to repair parts permits reproducing these to their original accurate sizes whenever field service is required.

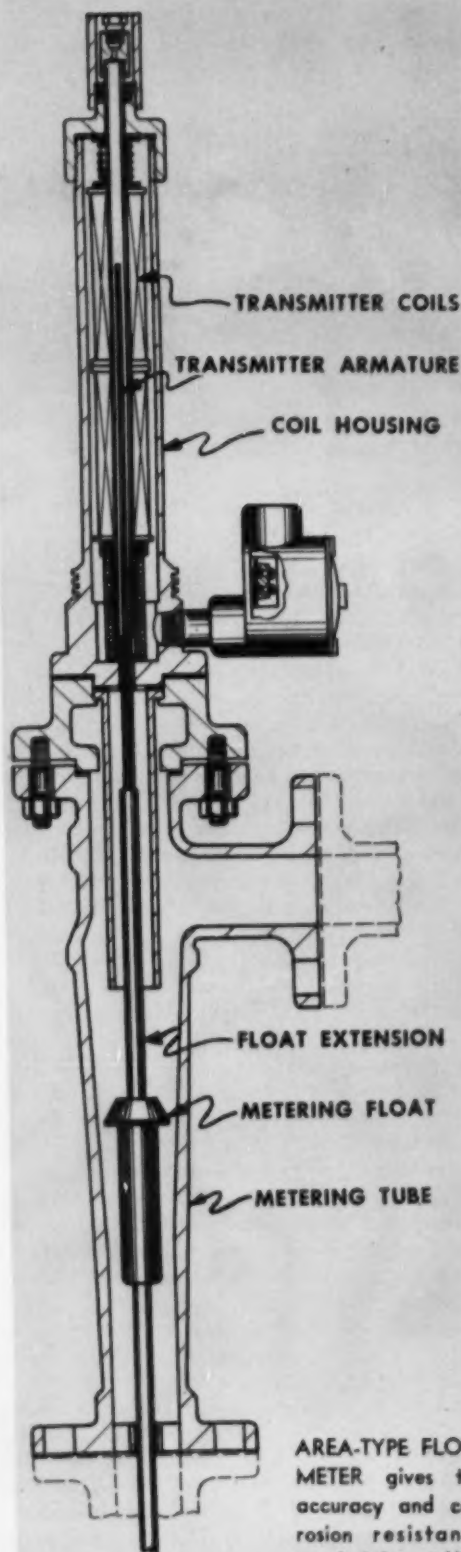
Removes guesswork—

Instrumentation: Controlled Measurement Lowers Pickling Costs

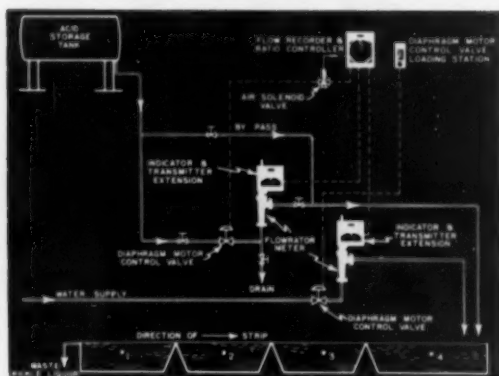
By D. H. KROUSE,
Divisional Manager,
Fischer & Porter Co., Hatboro, Pa.

♦ Savings in pickling costs, through instrumentation, more than pay for the small installation cost . . . Use of less acid and the reduced volume of waste pickle liquor are direct benefits . . . But greater accuracy of control enables stricter adherence to pickling specifications.

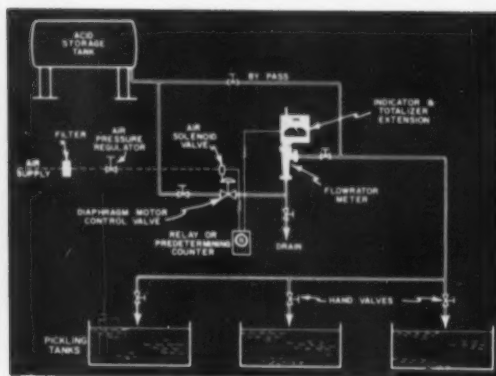
♦ Instruments are simple and foolproof . . . They not only provide accurate flow and proportioning of acid solutions, but give the total consumption which simplifies accounting . . . In a cascade continuous strip pickling line, acid savings alone range from 10 to 43 pct.



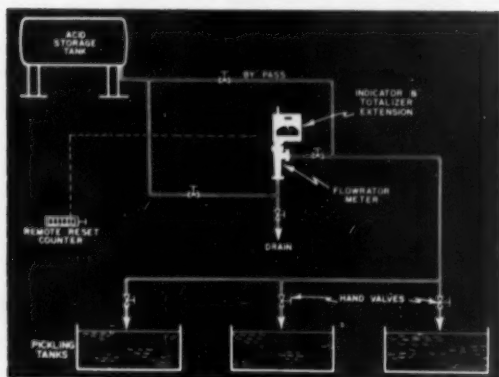
AREA-TYPE FLOW METER gives the accuracy and corrosion resistance needed for pickling applications. It has a long service life.



ONE FLOW METER in a batch control system simplifies measurement of acid considerably. It can supply any number of tanks—one at a time.



CASCADE-TYPE strip pickling system includes acid-water proportioning equipment for continuous make-up. Entry of flow is at exit tank.



AUTOMATIC batch control system allows only a preset amount of acid to flow to pickling tanks. For safety, system shuts off if anything fails.

♦ MEASUREMENT and control of fresh acid addition to pickling processes through the use of modern instrumentation can be economically justified by decreased acid consumption and decreased volume of waste pickle liquor. Acid savings of 10 to 43 pct have resulted. In addition, such control affords acceleration of the acid addition, a means of strictly accounting for acid consumed and safety and conveniences to operating personnel.

Probably the most common means of measurement used in transferring acid from bulk storage to pickling tanks is that of the measuring tank. This open tank, installed usually on a gravity feed, is filled periodically from the storage tank and then the desired additions to the picklers are measured out. Measurement is made either by external glass gages or by the unpopular and hazardous dip stick. This method is entirely dependent on manual control by the operator.

In some pickling operations, no attempt is made at acid measurement. A valve on the acid

line from the bulk storage is opened in the pickler and allowed to run at will until by some rule-of-the-thumb calculation it has been determined that sufficient acid has been added.

By installing flow meters and related automatic control equipment in a closed pipe line directly between the acid storage and the picklers, inadequacies of these methods are eliminated. There are two general pickling methods employed in the steel processing industry. The batch method, where periodic fresh make-up of acid is required in each tank, and the cascade method in strip preparation where pickle liquor flows in counter direction to the strip through a series of connected tanks.

The essential requisites of a flow meter to handle acid flows are the ability to withstand the corrosion, and simplicity of construction and operation. The area-type flow meter satisfies these requirements. The metering elements consist of a precise, tapered tube in which a variable orifice opening is attained through the vertical positioning of a float in the tube in response to changes in rate of flow.

The position of the float, representing an accurate and instantaneous indication of a rate of flow, is indicated externally. For acid applications, this is usually accomplished by means of a magnetic coupling between an extension of the float itself and an external follower arm. Suitable linkage from this follower arm affords an indication or recording of the measured rate.

Careful consideration must be given to the construction of the wetted metallic parts of the instrument. The metering tube and float are the most critical since their initial dimensions must be maintained in order to perpetuate the accuracy of the device. For the various pickling acids employed, selection of corrosion-resistant materials has been made on the basis of experience of actual service.

The meter is installed in the pipe line between the acid storage tank and the various picklers.

One control system is capable of supplying any number of individual pickling tanks consistent with the ability to schedule additions of acid to them one at a time.

In addition to providing the indication of rate of flow of the acid, the meter is equipped with an integrator which converts the rate flow to total gallonage or poundage. The primary counter connected with this integrator is located in the case of the instrument and is non-reset function. This counter provides the consumption data for accounting purposes.

Since the metering device is normally located in some protected area remote from the pickling operation, it is desirable to have one or more reset counters which reproduce the information of the main counter near the hand valve to the individual tanks for the convenience of the operators.

The system satisfies the requirements for a means of accurately and safely transferring the acid from storage to picklers. However, the operator must watch the counters and terminate the flow when the transfer is completed. The addition of components to make this system automatic is very desirable.

In the automatic arrangement, a relay counter or counters are located convenient to the point of operation. These counters enable a presetting of the desired amount of acid to be transferred. The load circuit of the counter is connected to a three-way air solenoid which, in turn, actuates an air-operated diaphragm motor valve installed in the main acid flow line.

Make-up ratio held accurately

In the cycle of operation, the operator opens the hand valve to the pickling tank to be filled, sets the desired amount on the relay counter dial, and then energizes the electrical circuit by pressing a momentary push button integral with the counter. This energizes the solenoid valve admitting air to the diaphragm of the control valve, which opens it. Acid flows through the system and when the quantity, which has been preset, passes through the meter, the relay resets, de-energizing the electrical circuit which, in turn, exhausts air from the valve diaphragm and closes it.

Most cascade pickling lines are conventional inasmuch as the flow of the acid solution is made counter-current to the strip movement. Fresh make-up of acid and water is introduced at the last pickling tank and the spent liquor is drawn off at the entry tank. Such a pickling arrangement demands that there be a flexible method of regulating the total input of make-up solution and for proportioning the acid flow to that of the water admitted. Titration of the solution in the various tanks of the cascade determines these requirements.

The area-type flow meter with its ability to handle corrosive flows and its inherent straight-

line measuring characteristic, has proved suitable for these requirements. The acid and the make-up water are independently metered and admitted to the exit tank. The respective flow rates are pneumatically transmitted to a dual recorder and a proportional controller.

The function of the controller is that of maintaining a strict ratio between the flow of water and acid irrespective of change in total input. This instrument affords a means of manually changing the ratio in accordance with acid concentration requirement for the material being pickled.

Proportioning done remotely

Most cascade lines have central control panels, or rooms, where the flow recorder-controller of the acid proportioning system is located. Since it is generally acceptable practice to proportion the acid to the water flow and there is a need to vary the rate of flow of the water to effect total make-up, a remote means for performing this function is provided. It is normally done by pneumatic positioning of a control valve in the water line by means of a loading station adjacent to the controller on the panel.

The modern integrated cascade pickling lines are so well designed that an irregular concentration of acid does not occur in the various tanks or divisions in the line. There is no necessity during normal operation to add acid in any other location than at the exit tank.

There are times when, for the purpose of repairing or sludge draining, it is necessary to remove the contents of individual tanks or sections. When these conditions arise, it is desirable to refill the depleted tank with fresh water and acid without interfering with normal strip processing. Installation of an acid batch control system under these conditions is normally included in large cascade lines.

With increased pressure on industry to eliminate industrial wastes which contaminate natural drainages, many methods are under study for acceptable and economical means of disposal of waste pickle liquor. The conventional practice of neutralizing with an alkali is well known and has been in use for many years.

There are today, in the flow sheet stage, practical processes that permit the full recovery of the acid and, as a by-product, iron oxide. Such processes require, in addition to a high initial investment, a large volume of waste pickle liquor to make the process economically feasible.

A less involved and less complete process now being used shows merit for the lower volume operator. It continuously removes iron sulphate by evaporation with the concentrate being centrifuged to separate the sulphate crystals and the dilute sulphuric acid. This acid represents a partial recovery and is returned to the pickling process. Acid lost in the form of sulphate must be periodically or continuously replaced.

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New Technical Literature:

Catalogues and Bulletins

Broach design

An interesting catalog comprehensively covers the subject of broaches and their design. Fully illustrated, it contains a section on internal broaches, surface broaches, keyway broaching, and resharpener and care of broaches. Another section describes in detail the various machines and their many applications. *American Broach & Machine Co.*

For free copy circle No. 1 on postcard, p. 141.

Ductility

The subject of "High-speed annealing brass strip for improved ductility" is discussed in a new bulletin.

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The brass strip, which has a fine, controlled grain structure and maximum ductility, is produced in a continuous strip-annealing furnace—in less than ten seconds heating time. *Selas Corp. of America.*

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Hydraulic standards

An up-to-date issue of the J. I. C. hydraulic standards for industrial equipment is now available from a manufacturer of power cylinders, boosters and accumulators. Also included are the recommended practices on hydraulic packings and seals, examples of packing code identification, sample circuit using J. I. C. symbols, and a glossary of terms. *Miller Fluid Power Co.*

For free copy circle No. 3 on postcard, p. 141.

Hydrants

To help engineers, builders, plumbing contractors and other specifiers select the correct hydrant for every type of installation, this illustrated 16-page catalog of non-freezing ground and wall-type hydrants has been issued. It contains hose and pipe sizes, engineering drawings, recommended specifications and other helpful data. *Plumbing Div., J. A. Zurn Mfg. Co.*

For free copy circle No. 4 on postcard, p. 141.

Welding

An 8-page catalog which will prove useful to welding readers tells why and how hard-surfacing should be applied to obtain best results. Ran-ite smooth flowing electrodes are described and illustrated and suggested applications are given. *Rankin Manufacturing Co.*

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Liquid chiller

The flexibility of the Flow-Therm liquid chiller for air conditioning, heat pump and industrial liquid cooling applications is emphasized in a new catalog. Major components of this factory assembled unit are matched, in the exact capacity needed for efficient and economical performance, to the make and size of compressor used in the system. *Acme Industries, Inc.*

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WISCONSIN-POWERED LAD-E-VATOR *Speeds Up* **MATERIALS HANDLING** **...CUTS COSTS!**

This ingeniously designed extension hoist lifts materials up as high as 80 ft. in one minute, according to the builder, Campbell Equipment Co., Chicago, Ill. Provides easy, one man, one hand control and delivers all kinds of loose and bulk materials directly to the working area for automatic dumping or removal by workmen. Designed for use on construction or storage jobs, it eliminates dangerous swinging buckets and risky reaching operations. Can be used with platform, wheelbarrow or scoop, carrying up to 1,000 lbs. per load.

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FREE TECHNICAL LITERATURE

Cooling tower

A cooling tower catalog, containing a wealth of new material on cooling towers used with air compressors has just been published. The units save more than 95% of the water which is used in industrial plants for cooling compressor jackets, intercoolers, and aftercoolers. Tables, drawings and graphs, and cooling tower nominal ratings are included. *Halstead & Mitchell.*

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Compressors

Gas-engine-driven compressors in the 330 to 660 horsepower range are the subject of a 44-page bulletin, which covers all the features of Type SVG four-cycle gas-engine-driven compressors. These compressors are especially suited for oil field, refinery and natural gas applications as well as industrial plants where gas fuel is available. *Ingersoll-Rand Co.*

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Dynamic response

A 12-page illustrated bulletin describes the new line of motors with dynamic response. The booklet explains how dynamic response is the new standard performance of the Super 'T' Motors, which was formerly found only in specially designed motors. Photographs, diagrams, charts and sketches help to illustrate this story of dynamic response. *Reliance Electric & Engineering Co.*

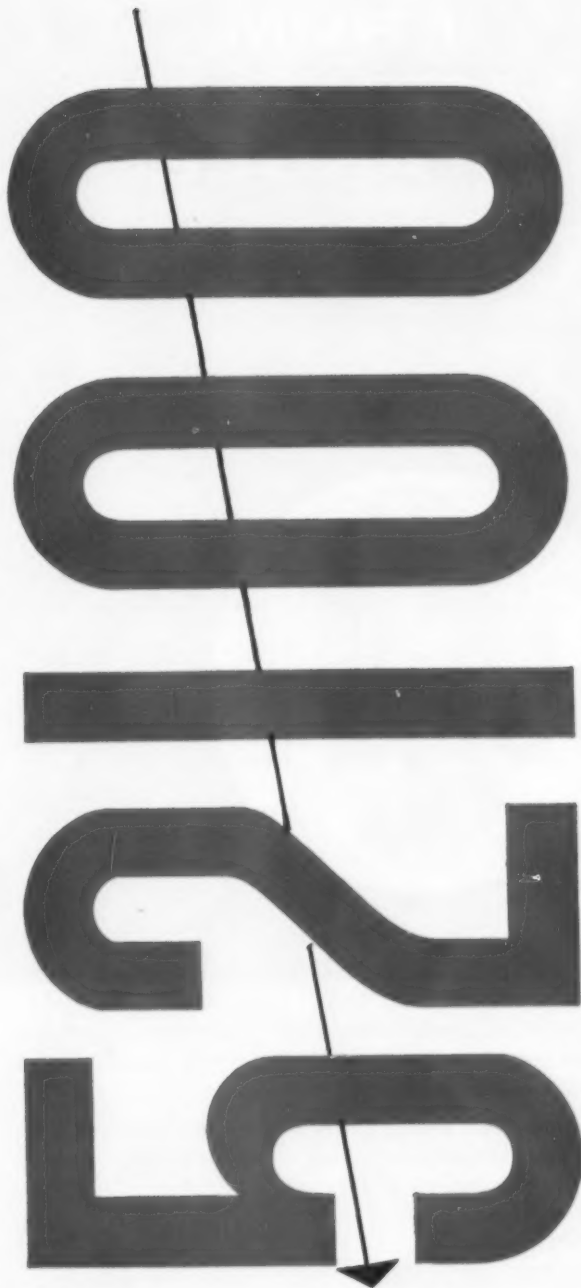
For free copy circle No. 9 on postcard, p. 141.

Expansion joints

This booklet describes rubber expansion joints. They are flexible rubber connections installed in pipe lines for the purpose of relieving stresses and strains in the piping and equipment. These joints compensate for linear expansion and contraction of the line due to temperature changes, absorb vibration, and compensate for misalignment in the piping. *The Garlock Packing Co.*

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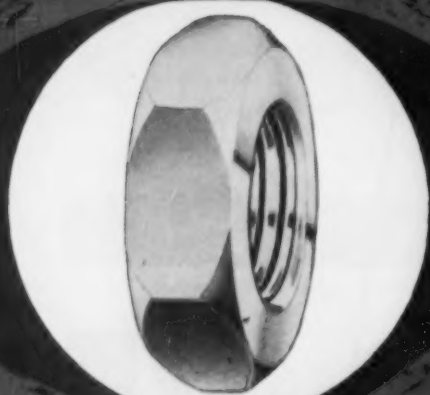
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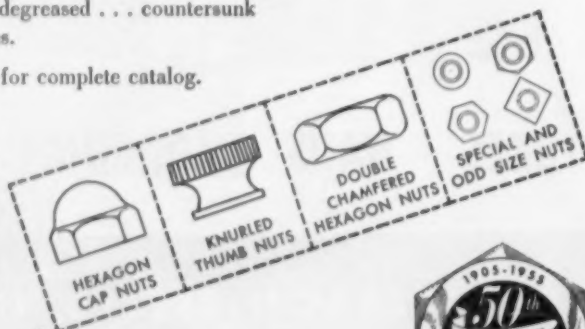
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FREE TECHNICAL LITERATURE

Electrodes

Ampeco-Trode 46 electrodes and filler rods are the subject of a new bulletin. Information is provided regarding identification, chemical composition, mechanical properties, current recommendations with the various processes and welding procedure. *Ampeco Metal, Inc.*

For free copy circle No. 11 on postcard, p. 141.

Carbon steel

Carbon steel tubing for heat exchangers and condensers is described in this brochure. A typical specification, A.S.T.M. A-214, covering this grade of tubing has been broken down paragraph by paragraph to show how Electrunite tubing is processed to meet each requirement in the specification. *Steel & Tubes Div., Republic Steel Corp.*

For free copy circle No. 12 on postcard, p. 141.

Branded for life

A bright red and black brochure is being distributed by the manufacturer of Metal-Cals, the anodized, etched aluminum nameplate. Explains in detail how Metal-Cals may be used for quick, economical trade-marking, serial numbering, service labeling, catalog and parts numbering and dial and gauge marking. *C & H Supply Co.*

For free copy circle No. 13 on postcard, p. 141.

Safety equipment

A general catalog on industrial safety equipment is easy to read, fully illustrated, and designed as a workable, everyday safety manual. It is divided into four major sections—eye protection, head protection, respiratory protection, and welding. A reference book of interest. *Willson Products, Inc.*

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Wire rope

A folder describes wire rope made from Roebling's 1105 wire. This wire is cold drawn from Roebling Steel to exact specifications, then fabricated into ropes which are strong, tough and durable. Giant vertical testing machine, one of the largest of its type in the world, on which the wire is tested is shown. *John A. Roebling's Sons Corp.*

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SITUATION UNDER CONTROL

BY KEOKUK

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"Me no need teach Little Chief—him say modern generation learn make teepee on TV!"

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Brainard salesman Tom McMahon checks steel strapping of maple wood flooring. Large number of pieces in heavy bundles require extra tension supplied with Brainard strapping tools.

STEEL STRAPPING



Photos courtesy Albron Floors, Inc., Albron, Ohio

STRAPPING TAPE

In the same plant, light bundles of aluminum face strip are banded with Brainard strapping tape. This aluminum strip is used for decorative trim. Brainard strapping tape assures tight bundling. No danger of marring the product.

● Here is Brainard salesman Tom McMahon helping one customer apply both steel strapping and strapping tape . . . each for the job they do best.

Only Brainard salesmen offer *both* steel strapping and strapping tape and can give you *unbiased* recommendations from a single source of supply. For a Brainard Strapping Analysis call your nearby Brainard salesman today, or write Brainard Steel Division, Dept. I-4, Griswold Street, Warren, Ohio.



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This section starts on page 136

Aluminum products

Although the use of cast aluminum tooling plate and barstock is spreading rapidly, there still remain unexplored opportunities for their application. In this bulletin are presented basic facts to help you understand how this material can be applied in your plant and to point out its many advantages, such as strength, stability, ease of fabrication and machinability. *Red Seal Metals Co.*

For free copy circle No. 16 on postcard, p. 141.

Truck catalog

A 64-page catalog, illustrating and describing the firm's complete line of platform trucks, two-wheel trucks, shelf and tray trucks, box trucks, wagon trucks, skids, dollies, etc. for every industrial and commercial use. Includes full technical data and specifications on the Hamilton line, and available accessories. *The Hamilton Caster & Mfg. Co.*

For free copy circle No. 17 on postcard, p. 141.

Trimming equipment

The operation of the Brehm trimming die and the Brehm trimming press is described in detail in this new booklet, which also points out the applications of this equipment in the metalworking industry. Illustrations and specifications are included. *The Steel Products Engineering Co.*

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Valves

OIC Valves for the L-P gas industry, which provide a safe, absolute seal and extra-long service, are described in a folder, complete with illustrations and charts giving pressure-temperature ratings and general dimensions. *Otto Injector Co.*

For free copy circle No. 19 on postcard, p. 141.

Phosphate coating

Seven types of phosphate coatings for the protection of metal surfaces from corrosion are discussed in a new booklet. Specific coatings are described from the standpoint of use, application cycle, effect, characteristics, and coating weight. Latest types of equipment are described and illustrated. *Metalwash Machinery Corp.*

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Equipment information

This new catalog has practical engineering information accompanied with a pictorial review and sketches. It will be helpful in your selection of contractors. It covers such topics as: bulk materials handling, unit materials handling, foundry equipment engineered systems, steel fabrication and erection, automation and special handling machinery, facilities and services. *Planet Corp.*

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Grinding wheels

In addition to showing views of the various Nu-Matic Aircore models and describing their uses, the folder shows an exploded view of the air-inflated grinding wheel, its ease and versatility of mounting and disassembly. *Nu-Matic Grinders, Inc.*

For free copy circle No. 22 on postcard, p. 141.

Lathes

A new 14" lathe with variable speed drive is described and illustrated in this folder. The lathe is subjected to exacting testing procedure, and has machine cut, extra heavy and extra wide gears. Specifications are given. *Lathe Div., Logan Engineering Co.*

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Chemical control

Titration bulletin, fully illustrated with photographs, charts and curves shows reader why titration-by-instrumentation has made volumetric analysis just about the fastest and most convenient means of chemical control. The 3 main kinds of electrometric titration are explained clearly, and instrumentation for each kind is shown and explained. *Fisher Scientific Co.*

For free copy circle No. 24 on postcard, p. 141.

Waste water

This folder shows how costly waste water programs can be made to pay off in improvements to product quality, reduction of direct and indirect water costs, improvement of process methods, and reduction of water consumption. *Hall Laboratories, Inc.*

For free copy circle No. 28 on postcard, p. 141.

Improved coating

Grade M Kote-Rax, an improved coating for insulating and protecting racks and fixtures used in electroplating baths, is described in a 2-color bulletin. It tells how to prepare the surface of a rack or fixture before coating, and gives information on how to repair accidental breaks. It also includes a table that gives air-drying and baking time requirements for applications. *Hanson-Van Winkle-Munning Co.*

For free copy circle No. 29 on postcard, p. 141.

Crane cab conditioning

This 20-page bulletin sets a new high in giving briefly and accurately the whys and wherefores of crane cab air conditioning. The Lintern Corporation offers their experience and equipment in "Human engineering" crane cabs exposed to excessively high temperatures (as high as 230° F.), on both existing and new cranes. *The Lintern Corp.*

For free copy circle No. 25 on postcard, p. 141.

Dehydrator

The newest addition to the company's line of compressed air dehydrators is described. This unit is designed for small volumes of compressed air serving liquid level indicators, purge assemblies, remote control installations, and for dead-end service applications. Specifications of various models are given, with applications for the units. *Hankison Corp.*

For free copy circle No. 26 on postcard, p. 141.

Austempering

"The Present Status of Austempering and Martempering", a technical bulletin, was written by a metallurgist with the idea of summing up progress made to date in this increasingly popular heat treating field. The bulletin, written for practicing metallurgist and layman, includes history of development, basic S-curve theory, factors to be considered in selecting a specific treatment, and recent developments. *Ajax Electric Co.*

For free copy circle No. 27 on postcard, p. 141.

Ductile iron

The cast iron that can be bent—ductile iron—is an increasingly popular constructional material. It is the engineer's link between the useful properties of cast iron and steel. This 30-page booklet, illustrated with more than 40 photos, includes case histories, specification tables for the seven main types of ductile irons and charts comparing mechanical properties. *The International Nickel Co., Inc.*

For free copy circle No. 31 on postcard, p. 141.

Metal-clad switchgear

Metal-clad switchgear rated 2.4KV to 13.8KV and 50 to 500 MVA is comprehensively described in a new booklet. The four-color 52-page publication includes detailed discussion of applications, installation, maintenance, advanced design features, and accessories. Of interest are tables of dimensions and weights, foundation data, and guide form specifications for many applications. *General Electric Co.*

For free copy circle No. 30 on postcard, p. 141.

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B-RIGHT-ON[®]

SOCKET SCREW PRODUCTS

always measure up!



Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

Write for descriptive literature . . . see how

**YOU CAN DO BETTER WITH
B-RIGHT-ON.**

**THE BRIGHTON SCREW
& MANUFACTURING CO.**

1829 READING ROAD CINCINNATI 2, OHIO

FORMING: Pressure Vessel Heads

Big new press at Colorado Fuel and Iron, designed to exert 6,000,000 lb pressure, will be used to form heads for pressure vessels . . . Press shipped to plant on six flat cars.

A large 1,000,000 lb dead weight press has been designed and built for the Colorado Fuel and Iron Corp. by the Verson Allsteel Press Co. The press is designed to exert 6,000,000 lb pressure for forming heads for pressure vessels.

The new press will enable the western steel producer to produce heads ranging from 40 in. width and 36 in. depth up to a total diameter of 10 ft. Previously large diameter heads were spun, and a considerably higher rate of output can be expected from the pressing operation.

Cold Form $\frac{1}{4}$ in. Plate

The four story press exerts its 6,000,000 lb pressure on two rams and is a double action press, powered by a 300 hp electric motor. The equipment, though rated to deliver 3000 psi has a higher potential rating and could be boosted to 3250 tons if necessary. With its present rated capacity it will cold form 0.25 in. plate and will handle

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 141. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

various hot forming work as well.

The Verson press is one of the largest to be produced in the Chicago area to date, with its 144 sq in. working area, and 38 ft 6 in. height, was located in a 20 ft well during its assembly and testing at Verson, and was scheduled for shipment on six flat cars.

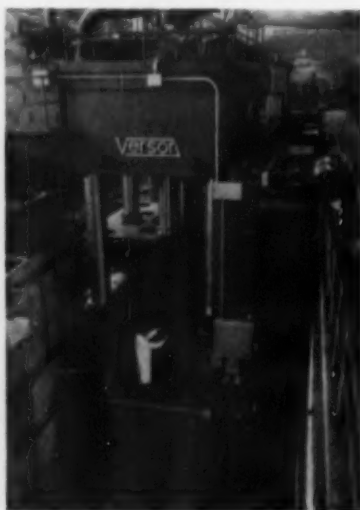
Brazing:

**Railroad signal bonds
brazed in a second.**

A one second brazing operation for connecting signal bonds between lengths of railroad track, will look good to most railroads and will probably suggest some non-railroading uses. Eliminating drill holes and chemicals, a special Nelson Stud Welding gun brazes a 5 in. bronze cable to the side of a rail with a silver bond for maximum conductivity.

Use Ceramic Ferrule

American Steel & Wire, one of the three developers of the method along with Nelson Stud Welding and Svenska Ab Gasaccumulator of Stockholm, Sweden, supplies a 5 in. bronze cable with copper lugs at each end: A Nelson knock-off pin with a ceramic ferrule is used. The pin is tipped with a silver solder section containing the flux.



Large capacity press . . .



NEW

*Allenpoint
Set Screws*

WITH
SCIENTIFICALLY-DESIGNED
SMALLER CUP POINTS

Smooth, deep point penetration for greater holding power and resistance to vibration; precision formed threads and accurate thread lead for maximum locking action. Comparative tests by leading laboratory prove Allen Set Screws unmatched in performance. Write to Advertising Department for Bulletin C-33A.

When ordering through your local industrial distributor, specify Genuine Allenpoint Set Screws.



ALLEN

MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.



TECHNICAL BRIEFS

The pin is knocked off, along with the cone shaped ceramic collar when the braze is complete.

Flux Cleans Braze

The ceramic collar protects the arc from air and concentrates heat in the braze when the gun is triggered to deliver 200 amps at 36 volts, flashing off the tip of the silver solder and allowing the contained flux to clean the braze.

The gun is battery powered and the complete unit includes a rail-roading dolly carrying the batteries and a gasoline driven charger.

The new method which has been named Tigerbraze, is calculated to double a track-crew rail bond output. Testing thus far indicates the bond will hold through the useful life of the rail.

Cutting:

Deseaming blowpipes used to remove plate.

By using deseaming blowpipes to remove old plate from barge bottoms, the Consolidated Western Steel Corp., Orange, Texas cut operating time from 4 days per barge to 1½—and cut costs approximately \$500 per barge.

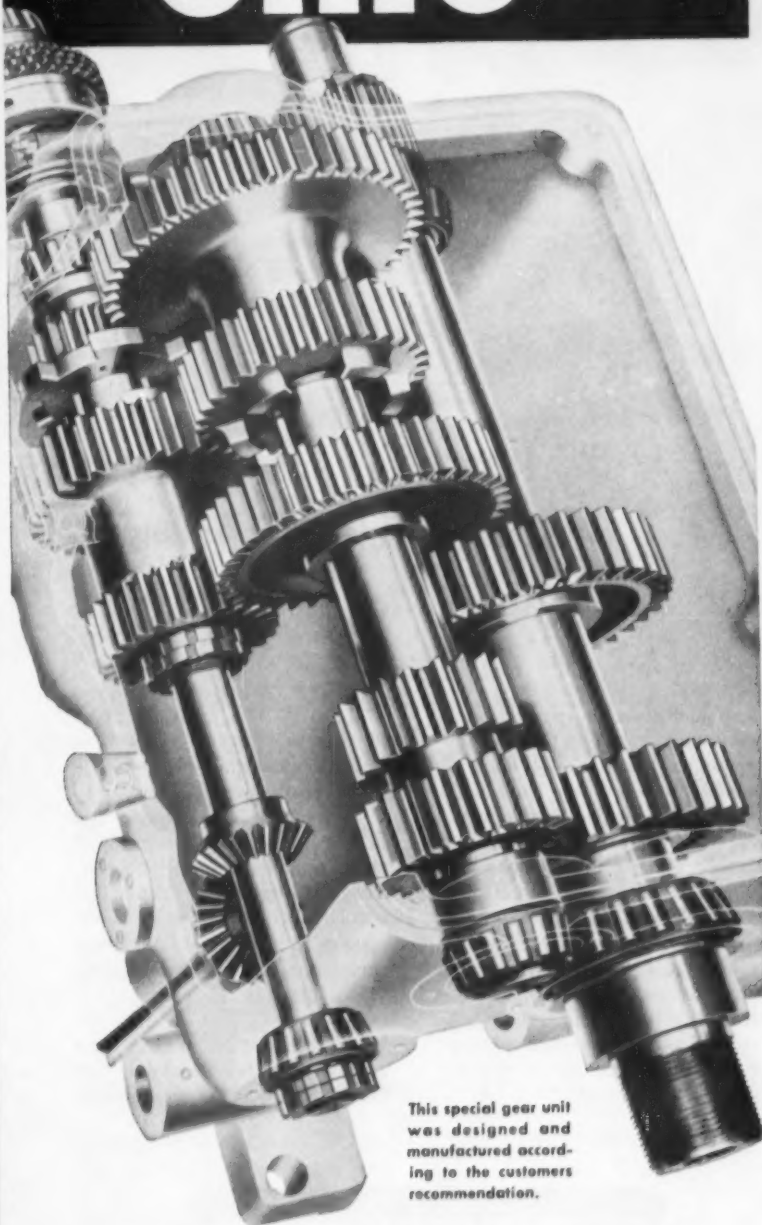
The steel company had 21 barges to re-bottom. Plant engineers decided to roll the barges over in the water, remove the old plate, and then Unionmelt weld new plate on the frames. However, be-



Deseaming blowpipe . . .

April 7, 1955

GEARS OHIO REDUCERS

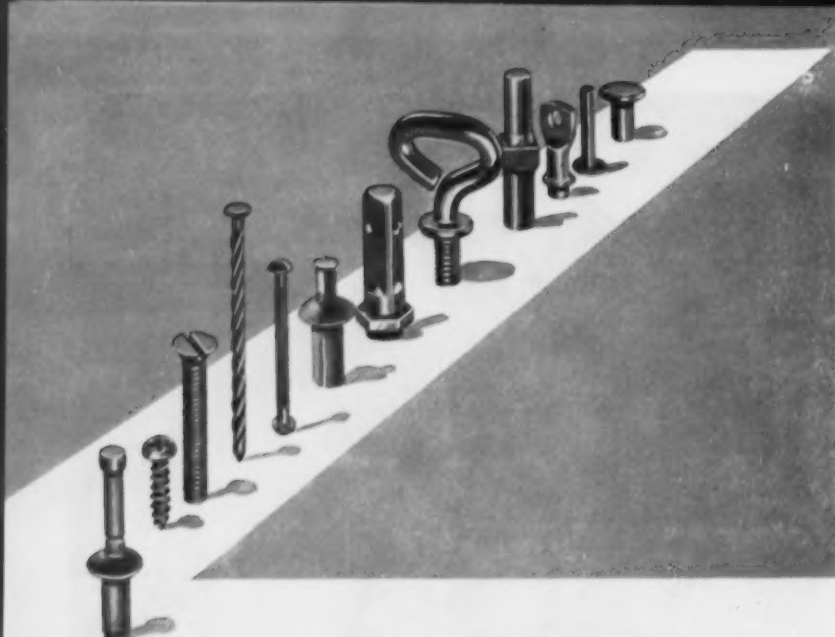


This special gear unit was designed and manufactured according to the customers recommendation.

Long experience, coupled with modern equipment makes Ohio Gear the choice of designers when "special" gears become part of the picture. Higher dimensional accuracies and quality are maintained through rigid production standards.



THE OHIO GEAR COMPANY, 1366 East 179th St., Cleveland 10, Ohio



How to stay ahead of your competition with Townsend special fasteners and parts

In today's highly competitive markets many design engineers and production managers find they improve products, reduce material costs and assembly time with Townsend's method of cold-forming fasteners and small parts. It enables them to put greater value into their products and at the same time hold unit costs down.

The Townsend method often replaces costly, material-wasting methods with savings that range from \$.70 to \$80.00 per thousand. Annual savings are often substantial—\$15,816 on an automobile door lock part—\$12,000 on a

washing machine fastener—\$11,190 on two parts for home laundry equipment—\$15,630 on two refrigerator fasteners—\$5,130 on an electrical connection.

Townsend engineers specialize in the assembly and fastening of all types of materials for all industry. They draw upon more than 10,000 standard and special items developed in 138 years of cold-forming experience and rely upon Townsend's capacity to produce 60-million pieces daily to give you the best in fastening methods. To learn how to improve fastening efficiency, ask to have an engineer call.

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

THE FASTENING AUTHORITY—Experience: over 138 years—**Capacity:** sixty-million parts daily—**Products:** over ten-thousand types of solid rivets—cold-headed parts—Cherry Blind Rivets—Twinfast Screws—self-tapping screws—tubular rivets—locknuts—special nails—formed wire parts.

Plants: New Brighton, Pa.—Chicago, Ill.—Plymouth, Mich.—Santa Ana, Calif.

In Canada: Formenter & Bulloch Manufacturing Company, Ltd., Gananoque, Ontario

TECHNICAL BRIEFS

Deseaming pipes removed welds faster . . .

fore removing the old plate, it was necessary to "open" seam-welds and plug welds, and remove rivets.

Cutting Time Reduced

Four standard flame-gouging blowpipes were used on the first barge, but the job was slow and costly. Plant engineers decided to try wide-pass deseaming blowpipes on the next barge. These blowpipes did such a fast, efficient job of removing welds, that only two Oxweld C-51 deseaming blowpipes were needed to complete the job on the remaining barges.

Oxygen consumption on this job was approximately 55 per cent less with the deseaming blowpipes, than with conventional flame-cutting equipment. In contrast to other flame processes used on steel, deseaming blowpipes have a low-velocity oxygen stream, and pressure may be varied according to the depth of penetration desired.

Deseaming blowpipes cut a flat pass in metal at high speeds, with minimum nicking into the support numbers below the plate. Operations are efficient and economical.

Quality:

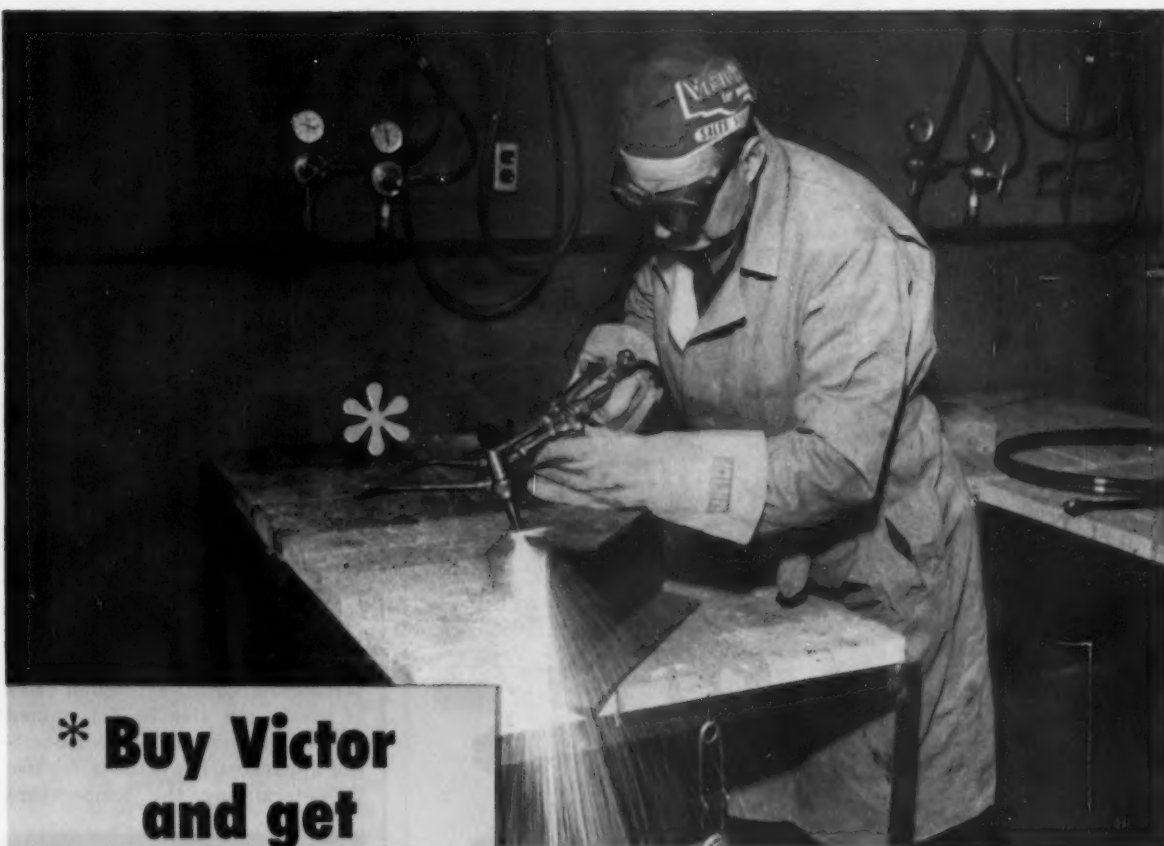
New control laboratory helps keep quality high.

A new quality control laboratory was recently placed in operation at The Babcock & Wilcox Co.'s Tubular Products Div. at Beaver Falls, Pa.

The laboratory, two stories high, comprising 29,000 sq ft of floor space, and more than 4 years in the planning and building, houses equipment of all kinds for inspection and testing procedures.

Houses Analysis Instruments

Included are two production control quantometers for determining the composition of steels by spectrographic methods. Babcock & Wilcox was one of the first steel producers in the U. S. to install such equipment for control of elec-

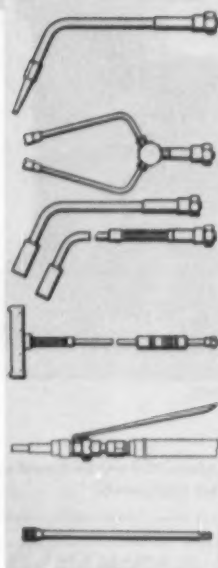


* Buy Victor and get Torch Versatility

Cutting with VICTOR Model 300 Series Torch Butt and Model 2450 Cutting Attachment; cuts to approximately 6".

The versatility of VICTOR torches means you can buy exactly what you need for today's job, then add other nozzles, tips and attachments as required. Your equipment grows with your needs; stays custom-fit to your work. For example, here are a few of the 34 standard attachments for VICTOR 300 Series Torch Butts.

Start right. Buy the versatile VICTOR torch that grows with your job. See it at your VICTOR dealers today . . . or write NOW for Catalog 20.



Welding . . .

Here's one of 10 standard single-tip nozzles available for general welding and preheating.

Heating, Brazing . . .

You have your choice of 11 standard multi-tip or multi-flame nozzles for preheating, brazing, silver soldering, etc.

Descaling, Flame Priming . . .

Save time and money with VICTOR attachments that fit your exact needs.

Automatic Gas Saver . . .

Shuts off welding gas, keeps pilot light on, saves as much as 75% of total gas consumption.

Nozzle Extensions . . .

Let you handle hard-to-reach jobs, keep you cooler on hot ones.

VICTOR

for welding

VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; hardfacing rods; blasting nozzles.

844 Folsom Street, SAN FRANCISCO 7 • 3821 Santa Fe Ave., LOS ANGELES 58

14

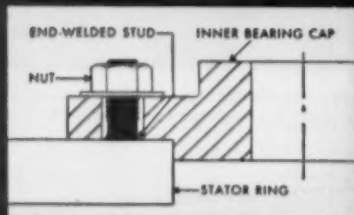


"STUD" NELSON ATTACHES SUB-ASSEMBLIES IN A FLASH!

Easy does it . . . a NELWELD® gun makes the placing of attachment studs a simple operation . . . takes the tool to the work . . . cuts costly material handling . . . eliminates drilling and tapping.

Studs stay put! . . . NELSON® welded studs fuse with the parent piece to become an integral unit, equally strong at the weld.

Trigger fast, too! . . . push a button and you've got a weld.



. . . just a few reasons why the NELWELD system is the practical way to attach fixtures, brackets, bearings, accessories, pillow blocks, and endless sub-assemblies.

A corps of Nelson experts is trained to help co-engineer better fastening with inevitable cost reduction. And the Nelson network of factory warehouses blankets the country . . . puts studs, equipment, and rentals right in your own back yard! Write for details.

Stud Nelson

Fasten it Better
at Less Cost
with



NELSON STUD WELDING
2737 Toledo Avenue
Lorain, Ohio

Please send more information on stud welding sub-assemblies and other applications.

NAME _____
COMPANY _____
ADDRESS _____
CITY AND STATE _____

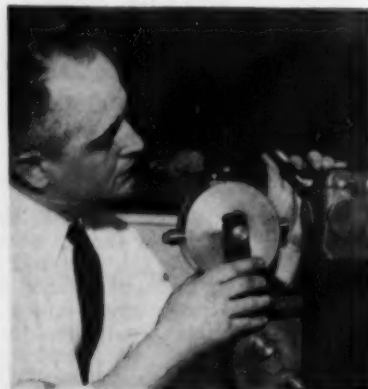
NELSON STUD WELDING DIV. OF GREGORY INDUSTRIES, INC. LORAIN, OHIO

tric furnaces. The composition of any steel can be determined by these units in from 5 to 15 minutes depending upon grade of steel.

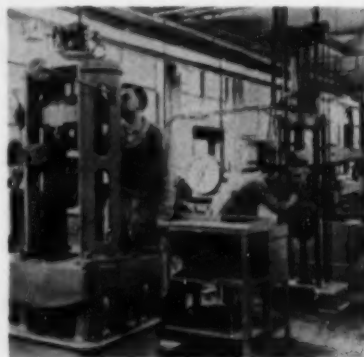
An x-ray room contains x-ray diffraction units which are used with a geiger counter spectrometer to study crystal structure, and with a fluorescence analyzer for rapid quantitative chemical analysis of selected alloying elements. Supplementing these is vacuum fusion equipment used to determine gas content of steel.

Analysis Time Cut

One of the important instruments in the area devoted to research, according to the announcement, is a dilatometer used to determine the critical transformation temperatures of steels which govern their heat-treating characteristics. Thermal expansion rates of steels can also be determined on this equipment. Hot twist-testing apparatus is available for use in determining the temperature



X-ray diffraction unit . . .



Tensile testing . . .

TECHNICAL BRIEFS

Pneumatic tube carries samples from laboratory to mill a mile away . . .

range of hot workability of alloy steels.

Of prime importance in steel making is the ability of a laboratory to provide chemical analyses to the steel mill in the shortest elapsed time possible. At B&W a pneumatic tube runs from the laboratory's chemical analysis room to the steel mill a mile away.

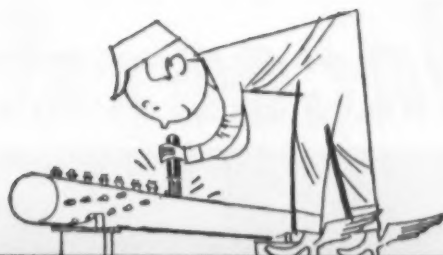
Samples Fed to Tube

Samples of alloy or stainless steel from the company's electric arc melting furnaces are fed into the tube at the steel mill, delivered, via the tube to the laboratory and the complete analysis is returned via telautograph with the total elapsed time, in many cases, being as short as 18 minutes.

At its Beaver Falls plant, the division produces seamless carbon, alloy and stainless steel tubing and welded stainless steel tubing for such industries as aircraft, chemical, oil, food and power, in addition to many atomic energy and other defense installations.



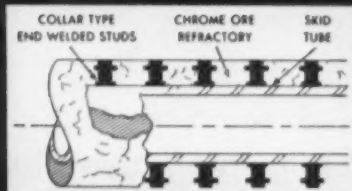
RIVETING deep down in the difficult confines between the inner and outer shells of jet engine cowlings might be considered an impossible task. Martin Aircraft, Baltimore, however, has developed U-shaped jaws which serve as the anvil of a squeeze-riveting tool. Mounted on a counterbalance, it can drive rivets located more than 12 in. deep.



"STUD" NELSON END-WELDS INSULATION STUDS IN A FLASH!

Encountering difficulty or high cost in securing or supporting insulation efficiently? If so, take a good look at the NELWELD® method.

NELSON® studs, end-welded in a split second, have solved hundreds of insulating problems for steel mills, all types of processing plants, and for manufacturers of boilers, heating and air conditioning equipment and tanks.



The NELSON collar stud, illustrated, is only one of many types that make insulating practical and profitable. Pins, hooks, rectangular studs, eye bolts, split and slotted studs . . . fasteners for any kind of insulation . . . open up design possibilities without limit.

Your Nelson Field Engineer is a fastening expert, experience-trained to analyze your product designs at the blueprint stage . . . the point where remarkable savings can be realized. Write for details, indicating your problem.

Stud Nelson

Fasten it Better
at Less Cost
with



NELSON STUD WELDING
2738 Toledo Avenue
Lorain, Ohio

Please send more information on securing insulation and other cost-saving NELWELD applications.

NAME _____

COMPANY _____

ADDRESS _____

CITY AND STATE _____

NELSON STUD WELDING DIV. OF GREGORY INDUSTRIES, INC. LORAIN, OHIO

ARCOS FOR FINEST QUALITY WELDS



Putting profitable benefits into welded aluminum tank cars

Besides permitting bigger pay loads with less "dead" weight, aluminum performs a dual role on this welded tank car. Inside, it provides even distribution of heat from heater coils to keep viscous fluids free-flowing for fast unloading. Outside it eliminates maintenance—never rusts, never needs painting.

An important key to success on any aluminum welding job is the quality of weld metal. Newly-developed ARCOS ALUMINUM RODS and ELECTRODES assure you a dependable answer to this requirement. They give you the properties you need to make the most from aluminum's durability, strength, appearance and maintenance-free qualities. Specify Arcos for profitable aluminum welding. Arcos Corporation, 1500 South 50th Street, Philadelphia 43, Pa.



WELD WITH ARCOS

ALUMINUM RODS AND ELECTRODES

Foundry:

**Integrated shell molding
system cuts foundry costs.**

A fully integrated shell molding system designed to advance the foundry industry one step closer to the automatic foundry is in operation in a malleable foundry. In this new system built by Link-Belt Co., Chicago, all process equipment from sand preparation to handling of finished castings are offered.

Two men operating the shell molding and closing machines can produce up to 240 molds per hour. These can be easily transferred to the pouring conveyor or stored indefinitely until needed.

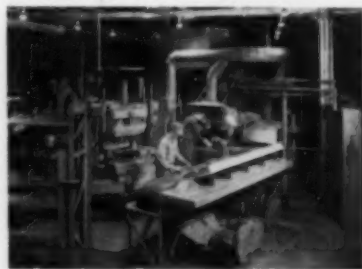
Uses of Stations

Shells are prepared on a four-station shell molding machine developed by Link-Belt in collaboration with and under patents acquired from Walworth Co. of New York. A similar machine now in operation at their Boston Works, makes molds for producing shell cast valve bodies and fittings.

The first station of the Link-Belt machine forms a shell by dropping a measured volume of thermosetting resin and sands on a heated metal pattern. A flask confines the sand and resin over the pattern, while water cooling prevents build-up on the inside surface of the flask.

Excess mix is removed by a roll-over motion, the flask is withdrawn, and the pattern with its soft plastic shell covering moves to two successive curing stations.

The shell is removed by the operator at the ejector station. The pattern is then sprayed with a release agent to facilitate shell re-



Pushbutton molding . . .

THE IRON AGE

TECHNICAL BRIEFS

moval and again passes to the investment station. The machine can make a shell every 15 seconds.

Maximum pattern size for shell molding machine is 20 x 30 in. Ordinarily this permits cope and drag shell to be made on each pattern plate. The metal pattern with heaters and supports can be readily changed.

Shells Conveyed to Pouring

As shells are removed from the molding machine, cores are set and the drag half is placed on a fixture in the Link-Belt closing machine. Adhesive is then applied around the mold cavity.

The cope half is put in place, and the air-operated mechanism holds the two halves together while the adhesive sets. Close tolerances between the cope and drag eliminate objectionable fins in the finished casting.

Shells are placed on a trolley conveyor for pouring. Small castings which are poured horizontally normally require no support. Sand, gravel or shot can be used to support the shell if necessary.

The use of shells permits a virtually dustless shakeout of castings. Waste sand and cores are quickly disposed of, in contrast to the large volume of hot sand which must be handled and reclaimed in a conventional system.

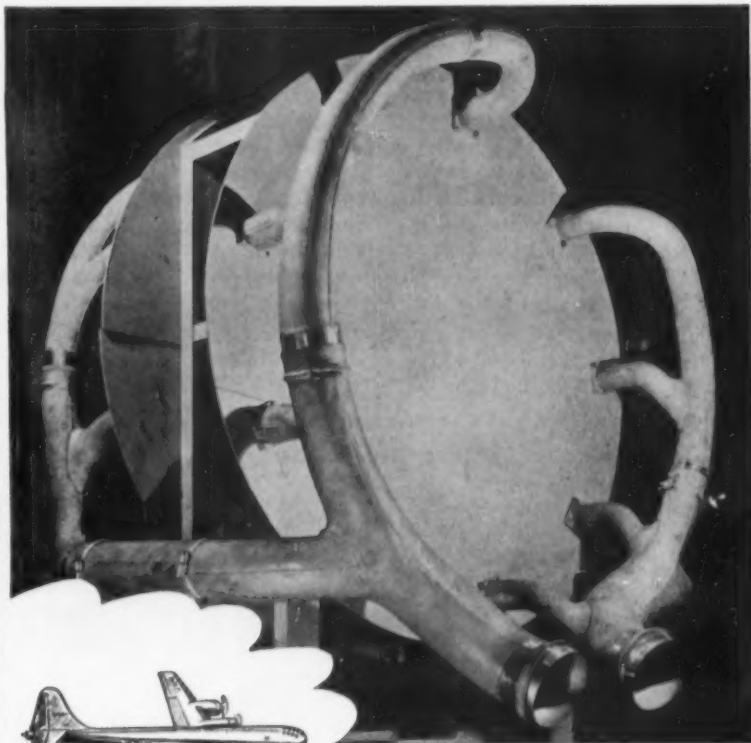
Casting Yield Higher

Castings produced by this method are smooth, clean and accurate, resulting in reduced cleaning room costs. A minimum of sprues or risers increases the yield of castings. Greater accuracy and smoother finish of the castings help reduce the cost of machining operations.



Pour horizontally . . .

ARCOS FOR FINEST QUALITY WELDS



Welded manifolds handle a hot problem

For maximum efficiency, the engines of fast-flying bombers and skycruisers operate at high temperatures. Exhaust manifolds get red hot . . . actually spit fire. Manifold materials and the welds must meet unusually rigid specifications.

On critical applications like this, Arcos Stainless Rods and Electrodes will produce the welds that will *not* fail under the terrific heat and vibration involved. When you need weld metal of this caliber for severe service, remember that Arcos filler metals are triple tested—each grade for its physical, chemical, and metallurgical qualities. Conscientious quality control by Arcos eliminates the expense and uncertainty of trial and error welding. In less time . . . at less cost, you get dependable welds for longer service. For proof—order Arcos Stainless Rods and Electrodes for your next tough job.

Arcos Corporation, 1500 South 50th Street, Philadelphia 43, Pa.

 **WELD WITH**
ARCOS
STAINLESS RODS AND ELECTRODES

The system is particularly adaptable for costly alloys where the amount of metal used must be carefully controlled.

The quality of the finished casting can be maintained by the operators through simple adjustment of controls.

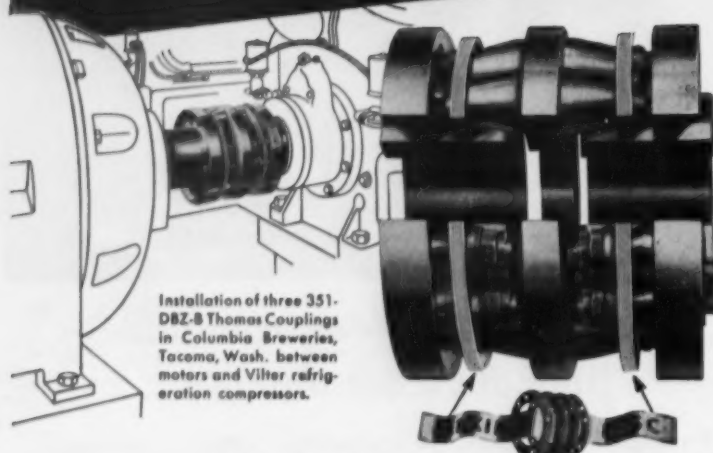
Thickness of the shell mold can be varied by changing the temperature of the pattern and the retention time at the investment station. The shell closing machine can be adjusted to assure a strong bond

between the shells and the speed of the pouring conveyor can be regulated to provide optimum cooling time for the castings.

Working Conditions Improved

The shell molding system can be laid out compactly and fitted into limited space. This flexibility permits economies in the arrangement of sand preparation equipment, molding and closing machines, storage, pouring and shakeout conveyors.

THOMAS FLEXIBLE COUPLINGS... for more years of better service!



Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and filter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

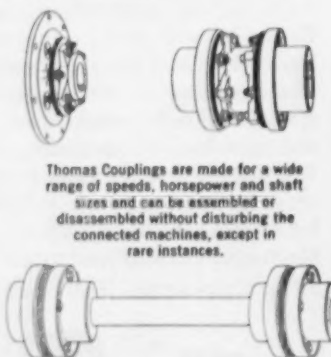
DISTINCTIVE ADVANTAGES	
FACT	EXPLANATION
NO MAINTENANCE	Requires No Attention, Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts, Freedom from Shut-downs.
NO BACKLASH	No Loose Parts, All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling, Elastic Constant Does Not Change, Original Balance is Maintained.



Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.

Air Cleaner:

Hydro-filter efficient
in cleaning-room work.

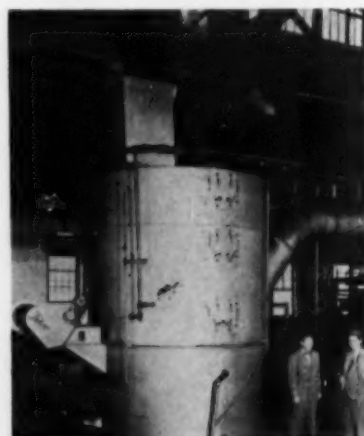
A new hydro-filter air cleaner now in use at several plants is showing filter efficiency up to 98.6 pct on particles that are usually found in a foundry shakeout room. The filter, built by the National Dust Collector Corp. and National Engineering Co., Chicago, also filters out bentonite and polishing agents with similar efficiency.

Featuring no moving parts, 25 units of this type have been installed thus far and field tests bear out laboratory findings. Basically, the unit is an air scrubber, utilizing collision of airborne dust particles against water, passage of this air through a water fog, followed by impingement against a horizontal bed of glass spheres.

Uses Aerated Pool

Passing through the bed, the already scrubbed air passes through a strongly aerated water pool located above the bed of "marbles," and through a water fog up through a second bed of glass spheres, this time to remove any water droplets remaining in the air stream.

Sludge dropping to the bottom of the first pool is drawn from the base of the filter by a slow speed conveyor, allowing the water to drain back into the pool.



Cleans air fast . . .

THE IRON AGE

Handling:

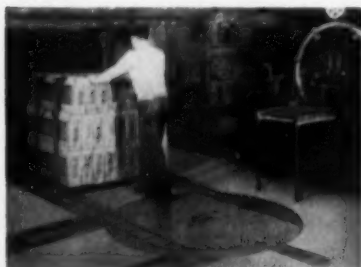
Double track system provides easy skid handling

A double trackage handling system that is flush with the floor is being used to free lift trucks for long hauls and for transferring material between departments. With the system one man can move pallets or skids along a production line without tying up floor space so that other wheeled objects may be moved through unobstructed aisleway.

The new system, built by Engineering Prod. Co., Inc., Chicago, is an adaptation of the original single Epco trackage system which has been widely used for many years in paper mills and corrugated box plants to handle heavy paper rolls.

Special Bearings Used

The rolling function is performed by the trackage itself which consists of a series of rollers, containing easy running sealed ball bearings especially designed for floor operation. The paper roll is carried on a special flat bottomed dolly which glides easily over the track rollers when pushed by one man.



Changes direction . . .



Travels on scales . . .

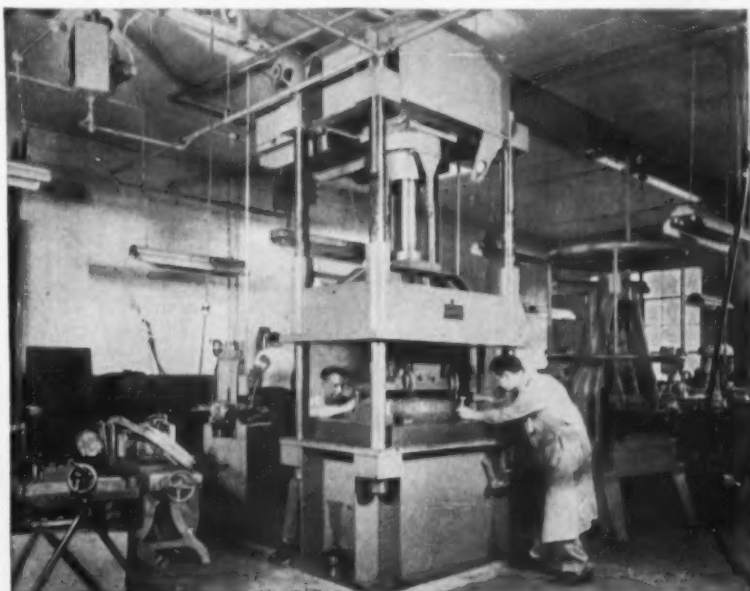
With this system, any kind of a load can be carried on a skid which bridges two parallel rows of trackage. The legs of the skids are actually runners which slide over the rollers.

The trackage can be installed into loading docks, bridges, scales, elevators or wherever required. Turntables are used to change direction.

The trackage is placed flush in

the floor, with tops of the rollers just above heavy steel safety treads. Foot and truck traffic can cross at any point.

One man is able to move heavily loaded skids from machine to machine or along assembly lines without delay. It is unnecessary to wait for lift trucks, which are kept free for long hauls and the general work for which they are best suited.



The diemaker who made a nuisance of himself

This is the story of Three Star Manufacturing Co.—a custom diemaker who serves a number of manufacturing plants in Chicago.

As in most such shops, his only means of trying out dies was a hand power screw press which sometimes needed six or seven men to get the needed pressure.

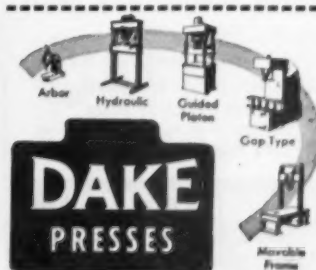
Large dies had to be tried out on his customers' production presses . . . which required drayage (\$15 to \$20 each way) and interruption of his customers' production. It meant both expense and nuisance to his customers and himself every

time a die had to be tested.

Now he has ended the nuisance by installing the press shown above in his own shop. It not only saves time and money, but avoids the embarrassment of having workers in his customers' plants see and know that occasionally a die must be taken back for adjustment.

Specifications for single-acting and double-acting die tryout presses in ten air-operated and sixteen electrically operated models are contained in Bulletin 267—sent gladly on request.

Dake Engine Company, 602 Seventh St., Grand Haven, Mich.



Send for Big New Catalog

DAKE ENGINE COMPANY
602 Seventh St., Grand Haven, Mich.
Please send me a copy of Dake Catalog No. 129
Name _____
Company _____
Address _____
City _____ Zone _____ State _____

Casting:

Mercury process offers production advantages.

Demand for higher operating temperatures and pressures in today's industrial and military equipment, combined with an emphasis on new materials and more compact design, have given added impetus to the use of frozen mer-

cury precision castings, Dr. I. R. Kramer, vice president of the Mercast Corp., New York, recently told the American Society of Tool Engineers at Los Angeles.

Difficult Conditions

Dr. Kramer added that "in such fields as petroleum and heavy chemical processing, food processing, power generation, transportation, metalworking, electri-

cal and electronics, the trend has been toward increasingly rigorous demands on equipment for more rapid and efficient operation."

Such new industries as the manufacture of radar equipment, and new materials such as the high nickel-chromium alloys and cobalt-base alloys, have imposed manufacturing conditions not easily met by conventional production methods, he stated.

While sand casting, forging and machining are used successfully to make many parts from these new alloys, a rather large number of parts is required which can be produced more economically by investment casting, Dr. Kramer pointed out. As the requirements have become more exacting, and larger and more complicated parts are needed, the use of the frozen mercury method is increasing.

Uses Ceramic Shell

This process, which consists of making a thin ceramic shell over a frozen mercury pattern (replica of the piece to be produced), has been an industrial technique for only about five years. When the refractory ceramic shell has been made, the mercury is melted out and the shell then becomes the expendable mold in which molten metal is cast.

Dr. Kramer outlined two principal characteristics of frozen mercury which make it well suited for many applications, and followed by describing some of the complex castings being produced successfully by the frozen mercury process.

Self Welds Easily

Advantages derived from the use of frozen mercury as a pattern material, he explained, stem from two fundamental physical properties of mercury: low volumetric change on melting, and the property which allows solid mercury to be self-welding.

The small volume change which occurs during melting permits the manufacture of parts of large size and permits the use of a thin shell mold, which is an advantage in itself.

HANSEN

QUICK-CONNECTIVE

2-WAY

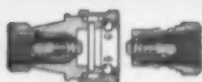
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COUPLINGS!



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AUTOMATIC FLOW
OR SHUT-OFF



**Seals Both Ends of Line
AUTOMATICALLY
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AIR • OIL • GREASE • HYDRAULIC
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PLUGS • HOSE CLAMP SOCKETS
HOSE CLAMP COUPLINGS • AIR
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GUNS • SAND BLAST CLEANERS
ENGINE CLEANERS**

To connect a Hansen Two-Way Shut-Off Coupling, you just pull back the sleeve and push the Plug into the Socket. To disconnect, merely pull back sleeve. No tools required. Similar valves in Socket and Plug shut off both ends of line when Coupling is disconnected—practically eliminate spilling of liquid or escape of gas at instant of disconnection.

FEMALE PIPE THREAD CONNECTIONS FROM 1/4" TO 1"

Hansen Series HK Two-Way Shut-Off Couplings are available with female pipe thread connections from 1/8" to 1" inclusive. Available in brass or steel.

*Also Straight-Through and One-Way
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QUICK-CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN



MANUFACTURING COMPANY

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TECHNICAL BRIEFS

Machining:

Vise provides fast, sure grip for milling setups.

Use of a lead hammer to tighten milling machine vises is common in many shops. Now one company, J. & S. Tool Co. of Livingston, N. J., has developed a vise sufficiently powerful which may be tightened without the need of hammer.

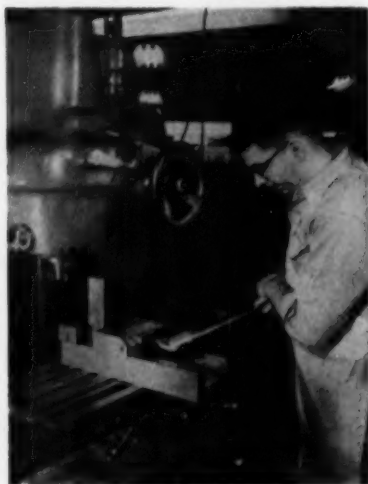
Tool steel pieces as long as $9\frac{3}{4} \times 3 \times 2$ in. are readily milled at the full power of the milling machine, without loosening, even when mounted endwise in the milling vise.

Quickly Reassembled

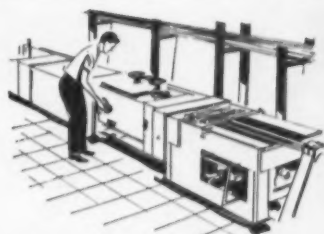
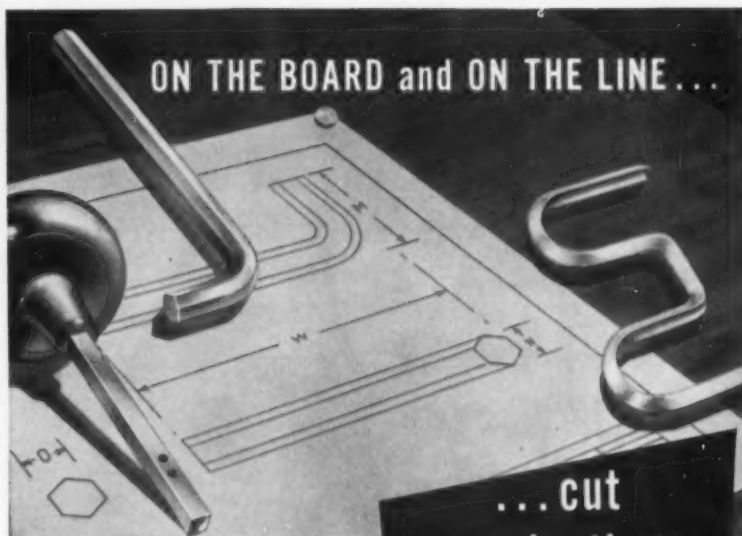
The vise is so constructed that it can be readily taken apart and carried in two pieces to the job. A movable jaw can be slid out of the base and very quickly reassembled on the machine. The vise weighs about one-half that of standard vises and it is made of cast steel hardened and ground to rest flat and solidly on the table.

The vise incorporates a swivel clamp graduated from 0° to 90° for easy positioning. Adjustments may be simply made by loosening the socket head bolts. A ratchet type of advance enables the operator to slide the movable jaw up to the work and then by turning the movable handle it is clamped tightly.

Opening and closing is fast and has been timed at one second. A handy trigger stop permits quick



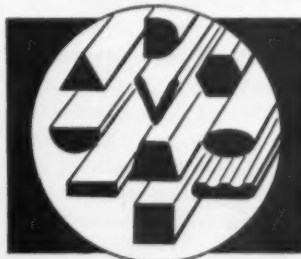
Tightening vise . . .



You can engineer greater savings in production when you use Continental round or special shaped wire. Usually you can reduce costs on expensive forging, stamping and rolling operations by using Continental special shaped wire. For product-trim or as a basic component, the right wire can help you cut corners—and you can get the right wire at Continental. We have solved countless problems

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costs with
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half-round	V-shaped
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oval	grooved flat wire
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square	bread-shaped
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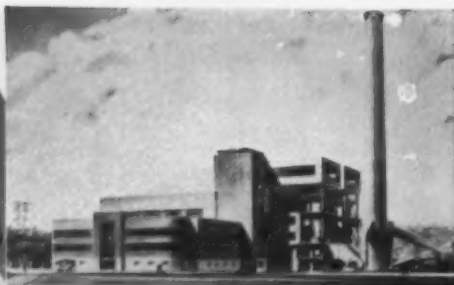
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"Steel Permits Streamlining Construction with Safety, Endurance and Economy"

Extra length of tightening handle provides greater leverage . . .

setting in proper position and when unloading, a quick turn and a finger trigger lift releases the load.

The knuckle handle is 18 in. long and permits selective tightening positions of the handle every 30°. The extra length of the handle provides greater leverage than usual and discourages hammering.

For holding angular pieces, pins are placed in two removable blocks which can be attached to the back jaw. Adjustable angle blocks are set as needed.

For holding round parts the same jaws are provided with tapered pieces that provide a V holding unit for centering and positively clamping.

The dual purpose fixed jaw has attachable vees to hold round work in vertical positions. The other side of the jaw has a down-holding clamping action. An adjustable angle bar may also be used.



Slide moves rapidly . . .



Setting angle block . . .

TECHNICAL BRIEFS

Refractories:

**Thin silicon carbide slabs
stand heat to 3000°F.**

A refractory that will permit more efficient firing of ceramic materials at higher temperatures has been developed by Electro Refractories & Abrasives Corp. of Buffalo, N. Y. The thin silicon carbide slab is capable of withstanding temperatures under load conditions up to 3000°F without warping or cracking, it is reported.

Used in Kilns

These refractory slabs are used in kilns for firing porcelainware. No other commercially available refractory materials have been known to stand up to the same load under tension at these temperatures, engineers claim.

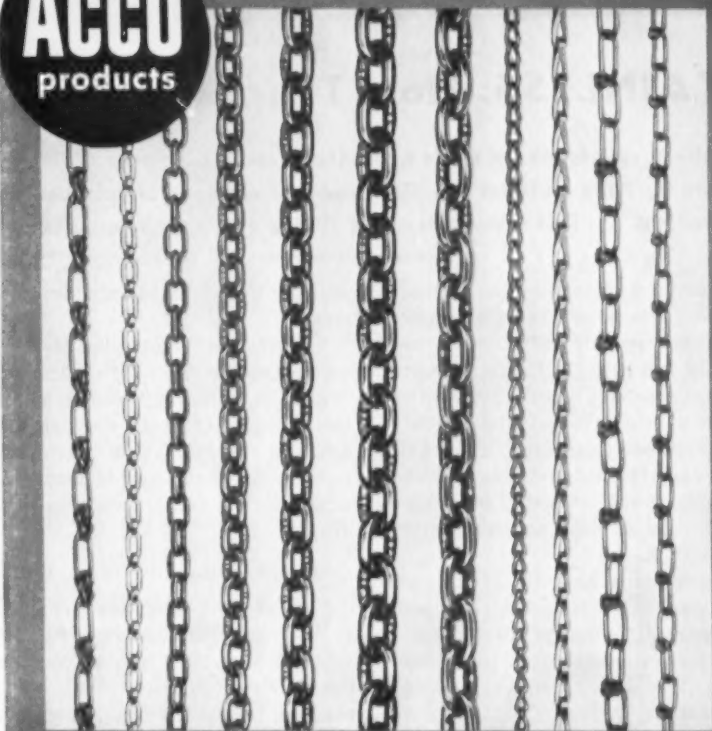
In extensive field tests, the slabs were used repeatedly to fire small porcelainware such as electrical insulators under extreme temperatures reaching as high as 3050°F. In other applications they have withstood sustained service at 3000°F. Previously available silicon carbide refractories have had a temperature limit of 2900°F for similar conditions of use.

Save Space, Fuel

The new refractory is said to be a space and fuel saver. Thickness necessary to carry the load is materially reduced, affording much greater setting area. And more of the heat is available to fire the products rather than the supporting refractories.

Some other refractory materials are able to take extremely high temperatures. However, they are impractical as slabs for this particular use. They would have to be several times thicker than the new silicon carbide slabs to hold equivalent loads.

Slab sizes used in Electro's field tests ranged from 8 x 10 x 1/2 in. thick up to 16 x 18 x 3/4 in. thick. In other applications, sizes as heavy as 23 x 25 x 3 in. thick have been successful.



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**plus
Links
Shackles
Hooks**

STAINLESS: How Type 329 Resists Corrosion

Excellent resistance to nitric-hydrofluoric acid solutions

shown by 7-Mo stainless . . . Finds use in equipment for pickling and similar operations . . . Test temperatures of 70° to 130°F were used in evaluating samples.

Excellent resistance to the corrosive attack of certain nitric-hydrofluoric acid solutions is reported for type 329 stainless steel in recent tests. Comparative studies made with No. 7-Mo stainless, Carpenter Steel Co.'s type 329 stainless, and type 316 stainless indicate the alloy would be useful for equipment used in pickling and similar operations.

An eastern manufacturer tried the steel in a production line test exposure after severe corrosive action was encountered on the equipment they were using. Baskets, racks and other parts made from type 316 stainless had deteriorated

rapidly, requiring costly replacement.

To help the plant solve its corrosion problem, The Carpenter Steel Co., Reading, Pa., supplied test samples of stainless type 316 and No. 7-Mo. These were immersed in the nitric-hydrofluoric acid solution under operating conditions.

Temperature from 70° to 130°F

Part of each specimen was held in the quiescent portion of the solution, and part was exposed to the aerated condition. Both were exposed to exactly the same medium as that encountered in normal

FOR MORE DATA ON MATERIALS

More information on any item reported in this section may be obtained by using the reply card on page 141. Indicate the page on which the item appears and note exactly the information wanted.

production — a solution of 17 pct nitric acid and 6½ pct hydrofluoric acid. They were exposed continuously for 117 days.


There was no agitation during the test. Temperature ranged from 70° to 130°F. Contaminants in the acid bath included chromium, iron and salts along with a sludge of metallic oxides.

After the exposure, the test samples showed the following corrosion rate in inches penetration per month: Type 316, 0.0074 ipm; No. 7-Mo, 0.0009 ipm.

A factor in the use of No. 7-Mo is that welded structures require subsequent annealing to restore full ductility and corrosion resistance of the metal. This obviates its use for applications (such as tanks) where final annealing is not usually feasible.



Everyone recognizes this
as a sign of spring . . .

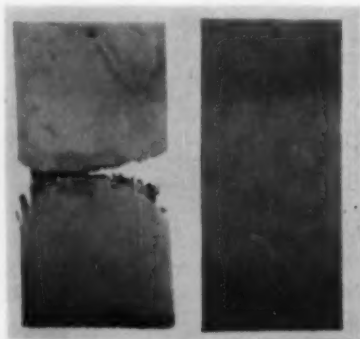
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Resistance compared . . .

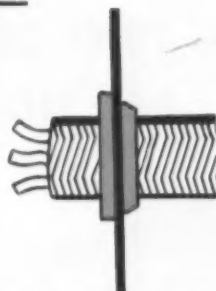
C-D-F *know how*
Designed and Fabricated
this DILECTO GROMMET



It springs out and holds tight!

Here's an idea and an example of C-D-F engineering skill teamed up with versatile Dilecto — laminated rolled plastic tubing — that can help you. Thousands of Dilecto grommets are being used in the aircraft industry for wire and cables that pass through bulkheads. Made from fine weave canvas, the C-D-F Dilecto grommet is cut into rings. The rings are grooved and beveled, then slit diagonally. The Dilecto grommet has a built-in tension that permits it to be easily compressed by hand and inserted in the bulkhead. Tension holds it tightly in place. It cushions. It insulates. It reduces assembly time.

DILECTO is a C-D-F top quality laminated thermosetting plastic whose uses are limited only by the imagination. Supplied in sheets, rods, tubes, Dilecto answers most electrical and radio needs for a material that is mechanically and dielectrically strong . . . resistant to high heat, hot oil, excessive humidity. It can be punched, stamped, formed and machined to close tolerances. C-D-F's Dilecto is available in many grades to meet a variety of requirements. See our general catalog in Sweet's Design File for more data, the address and telephone number of your nearest C-D-F sales engineer. Also, write for the new 1955 C-D-F Dilecto Catalog, free test samples, or send us your print for quotation.



Here's a side-view of a Dilecto grommet, machined to close tolerances from laminated rolled tubing. Sample of grommet and a general catalog will be sent on request.



Another example of a part machined from Dilecto rolled tubing. Notice variety of machining steps and the possible versatility of this mechanically strong material. Only C-D-F makes Dilecto in sheet, tube and rod forms.

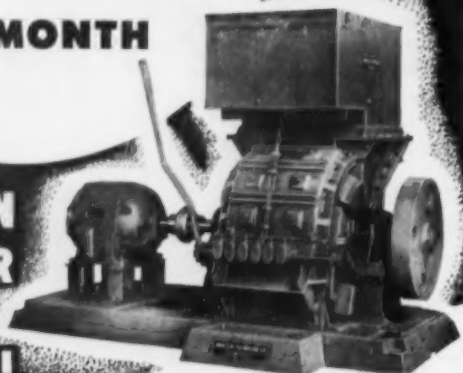


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METAL TURNINGS
AMOUNT TO
10 TONS OR MORE
PER MONTH**

**AN AMERICAN
METAL
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can bring you
NEW PROFITS!**



AMERICAN #2400
METAL TURNINGS CRUSHER

A chip salvage system, with an American Metal Turnings Crusher at the core, can help you realize new savings and profits in metal, oil, man-hours, factory space, and tool maintenance. Consider these typical money-saving, money-making advantages of an American installation:

- (1) Brings \$3 to \$4 more per ton for chips than for long machine shop turnings.
- (2) Reclaims 30 to 50 gallons of cutting oil per ton.
- (3) Prolongs tool life through more liberal use of recovered oil.
- (4) Saves 75% storage space . . . permits heavier freight car loads . . . cuts shipping costs.
- (5) Easier, faster handling.
- (6) Easier briquetting, so essential for foundry and steel mill use.

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Turnings Per Year \$ 960.00 Per Year
(20 tons per month at \$4 extra per ton)

3600 Gallons Cutting Oil Recovery at 30¢ Per Gallon . . \$1,080.00 Per Year
(30 gallons per ton x 240 tons = 7200 gallons.
Half of this, 3600 gallons, can be credited to
use of chips instead of long turnings.)

Estimated Savings on Manpower, Storage, Tool Main-
tenance, Freight, etc. \$ 300.00 Per Year

TOTAL GROSS PROFIT
(Resulting from an American Installation) \$2,340.00 Per Year

WRITE for American Rolling Ring
Metal Turnings Crusher Bulletin.

American
Originators and Manufacturers of
Ring Crushers and Pulverizers

PULVERIZER COMPANY

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Fabricating:

**Expanded metal solves
trailer bed problem.**

Expanded metal has found another unique application — use in truck and trailer beds which has increased pay loads. It is fabricated by Morrison Steel Co., New Brunswick, N. J., from grating supplied by Wheeling Corrugating Co., of Wheeling, W. Va.

State Laws Hurt

State limitations on weight and length of truck and trailer bodies had caused considerable trouble for Morrison. It solved the vexing problem by replacing plate steel with the diamond-shaped expanded metal in its truck beds.

This reduced overall weight of the vehicle by as much as 2 tons, increasing cargo weight proportionately. The increase in potential loads becomes staggering when multiplied by the number of trips per year and the number of trucks in operation.

Solves Drainage Problem

The fabricators used 4-lb per sq ft grating which was initially installed on one 18-ft straight truck and one 32-ft trailer. The durable, lightweight metal was welded to cross members and side railings.

Morrison Steel also found that it had surmounted a drainage obstacle with the new beds. All of these factors have attracted queries from trucking concerns and plans have been made for more extensive use of the material.

Produced from Solid Sheet

Expanded metal is produced from solid sheet that is slit and stretched to form a one-piece sheeting with uniform diamond-shaped openings.

No metal is removed during the expanding operations. Depending upon the gage and opening, the sheeting may cover 10 times the area of the solid sheet from which it is made. It can be given a variety of finishes, plain, lacquered, galvanized, painted, which are in wide use.

MATERIALS ROUNDUP

Wash Water:

Chemical agent removes solids in foundry waste.

A chemical flocculant which will remove suspended solids from foundry wash water has been developed by Monsanto Chemical Co., Springfield 2, Mass. The material, Lytron 886, is effective in concentrations of as little as two parts per million.

The problem of stream pollution is complicated by the nature of the contaminating solids which are finely-dispersed and difficult to filter out. Lytron 886 rapidly flocculates the solids in these slimy suspensions. The flocules settle quickly into a dense, filtrable sludge.

Water is Recircled

The Monsanto flocculating agent is said to offer an additional benefit to foundries in regions where the water supply is limited. Clarified water can be recycled to minimize the requirements for make-up water.

Coring

High-strength, lightweight material has many uses.

Large lightweight cores for use in stretch dies, jig dies, checking fixtures and models can now be built with greater strength than has previously been possible through use of an improved liquid phenolic resin.

Development of Corfoam 114 provides 50 pct more strength than previous Corfoam. The new material offers a compressive strength of 37 psi for a 3 lb density and

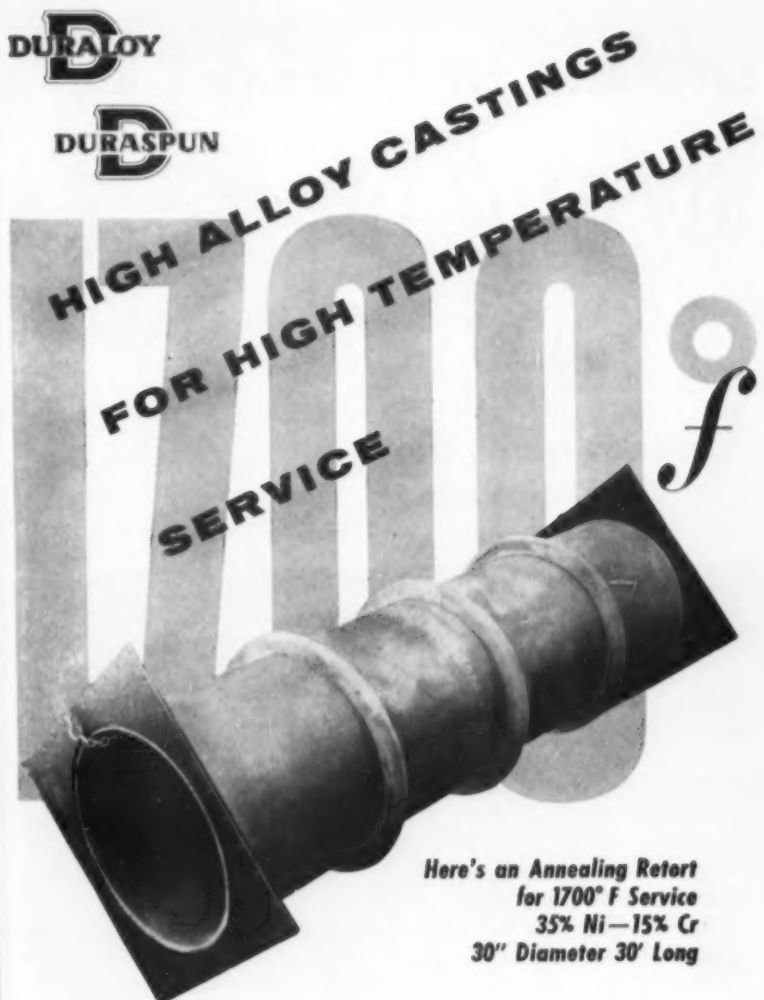


Large plastic casting . . .

April 7, 1955

DURALOY

DURASPUN



*Here's an Annealing Retort
for 1700° F Service
35% Ni—15% Cr
30" Diameter 30' Long*

Duraloy is the place to come for high alloy castings—for high temperature service, for highly corrosive service. Castings to your specifications are a Duraloy specialty.

We are equipped to do large and small work. We can turn out single static castings of 7 tons or more and single centrifugal castings up to about 4½ tons. On your next high alloy casting job, check with Duraloy!

Send for Bulletin No. 3354-G

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SHEPARD NILES Crane

OVERHEAD PASS

**speeds loads there
thru-the-air**



Put your handling where it belongs

... OVERHEAD where it's out of the way! By using a Shepard Niles Crane, you free floor space for production and storage, move loads quickly, safely, at low cost.

Choose from the complete line of cranes which Shepard Niles offers for light, medium or heavy service. Available for constant or intermittent duty in slow, medium and high

speeds... operated from pulpit, cab or floor. Featuring component parts designed and built by Shepard Niles expressly for crane service.

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Overhead: Top Running, Inner Running
Under Running, Floor or Cab Operated.



HOISTS

Operated from Cab,
Floor or Pulpit.

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CRANE AND HOIST CORPORATION

1455 Schuyler Ave., Montour Falls, N.Y.

Density of foamed plastic material controlled by foaming agent...

ranges to 1100 psi for the 21 lb density. Previously, the consumer was limited to only two densities with two products.

The high strength, lightweight material made by Rezolin, Inc., Los Angeles, is used for structural core applications. The liquid phenolic resin foams to a hard consistency at room temperature. The density is controlled by the amount of foaming agent used.

In addition to the use as a coring material, other uses include:

Insulating or sound proofing, buoyancy cores for marine applications, filler blocks for aircraft pressurizing tests, contour packing of delicate items.

Tinplate:

New flat rolled product helps cut processing costs.

Heavy gage electrolytically-coated tinplate—a new flat rolled product recently placed on the market—is receiving good trade acceptance, according to Jones & Laughlin Steel Corp.

J&L is producing the new product on the tinplate facilities at its Aliquippa, Pa., works. Users have been able to reduce material and processing costs on many stamped, drawn and plated parts, J&L reports.

Where corrosion is not too great a factor, the new tin plate is being used as a replacement for long ternes, aluminum, zinc-coated sheets and other metals of higher cost.

Advantages claimed for this matte-finish tinplate:

1. Surface conditions are excellent for subsequent plating and finishing.
2. Good paint adhesion properties.
3. Excellent deep drawing qualities.
4. No need for degreasing by the user.

Floors:

**Improved flooring material
may be used at once.**

A ready-to-use floor resurfacing material that is said to be smoother, easier to apply, and capable of withstanding heaviest traffic within one minute after application has been developed by the Monroe Company, Inc., Cleveland.

The plastic flooring, Swift-Floor Medium, is the result of a new precision production process which assures uniformity of each plastic granule used in preparing the material.

Material Compacts Faster

Because these granules are scientifically-sized and of a finer grade, the material compacts and knits together faster. The use of cryptolite, a crystalline material, improves the adhering and binding qualities and adds greatly to floor strength.

The ready-mixed material can easily be installed as a smooth, even floor, simply by spreading, then tamping or rolling. The floor will withstand 50,000 lb loads 60 seconds after application.

The material provides a solid base with less rolling or tamping than is ordinarily required. This is particularly important in areas where traffic is irregular and loads are not sufficiently heavy to immediately compress the material.



Use after 1 minute . . .

Accurately made, Superior quality

GARLOCK O-RINGS



Now stocked at all Garlock Branch Warehouses

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Yes, now you can obtain Garlock O-Rings direct from our branch warehouse nearest you. Each of our warehouses stocks 70 durometer rubber O-Rings in all popular standard sizes. For you this reduces delivery time to a minimum.

You can rely on Garlock O-Rings, too. They're made to Garlock's rigid quality standards. This means O-Rings with precise tolerances, a flash-free finish, and utmost uniformity.

For complete information, just contact your Garlock office or write for new O-Ring folder AD-148.

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

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for Every Forming, Forging, Bending Job



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250-TON HYDRAULIC
A-FRAME PRESS
Stroke, 30"; Daylight, 45";
Bed, 42" x 36"

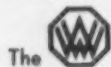


5485
S-1-250 42" x 36" TIE ROD PRESS
Stroke, 6"; Daylight, 24"; Bed,
42" x 36"; Capacity, 250 tons

WILLIAMS-WHITE & CO. machinery is custom-built to meet your needs. The presses illustrated above, one hydraulic with hand lever control, the other mechanical with foot-button control, are examples.

Whatever your production problem may be, WILLIAMS-WHITE & CO. engineers and designers are at your service to help you to determine whether, for most economical operation, your press should be mechanical or hydraulic, its capacity, speed, stroke, etc.

When you have a production problem, why not turn it over to our staff of engineers and designers. Whether you need presses like these or Punches, Bulldozers, Shears, Hammers, Rolls or other machines, WILLIAMS-WHITE experience of over 100 years is available to you.



The  on a WILLIAMS-WHITE Machine is your assurance of Quality, the result of over 100 years experience in building machinery.

Write us or one of our Representatives, TODAY, regarding your machinery requirements. Our engineering and designing service is available to you without obligation.

Features:

- Low Initial Cost
- Simple Design
- Sturdy Construction
- Long, Trouble-Free Service

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*For details, write any of our
representatives above, or direct to
WILLIAMS-WHITE & CO.*



BUILDERS OF MACHINERY SINCE 1854

WILLIAMS-WHITE & Co.

302 EIGHTH ST. • MOLINE, ILLINOIS • EST. 1854

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 141 or 142

Radial drill features flame-hardened column

The Hardclad column of a new radial drill is flame hardened by a process that retains built-in accuracies and prevents column scoring. It provides a thick-walled, centrifugal casting, accurately turned on high speed lathes, surface flame hardened, and then finish ground to close tolerances and a mirror-like finish. The radial drill features two-lever, direct-reading, color-match, spindle speed and feed shift dials. All controls

are grouped within easy reach of the operator. Nine spindle speeds and 6 power feeds are provided. Main drive motor is mounted on the arm to the left of the column, providing counter-balance and easy accessibility. The new radial is a 3 ft arm 7½ in. column machine with a drilling capacity of 1½ in. in cast iron, and it drills to the center of a 77 in. diam circle. *Cincinnati Lathe & Tool Co.*

For more data circle No. 32 on postcard, p. 141.



Tape recorder applies automatic operation to borer

The punch-tape principle of automatic operation has been applied to a precision boring machine used in the production of instrument gear trains. The system includes a standard 4-spindle Ex-Cell-O precision boring machine modified with built-in electronic controls and circuitry and a tape reader housed in a special control cabinet. Hole coordinates and feed instruc-

tions are punched on the tape by a perforating machine. Electronic signals from the tape regulate the linear travel of the machine's hydraulic cross slide and the rotary motion of the holding fixture mounted on the cross slide. Tape preparation requires 5 min per hole; changeover, 30 min. *Minneapolis-Honeywell Regulator Co.*

For more data circle No. 33 on postcard, p. 141.

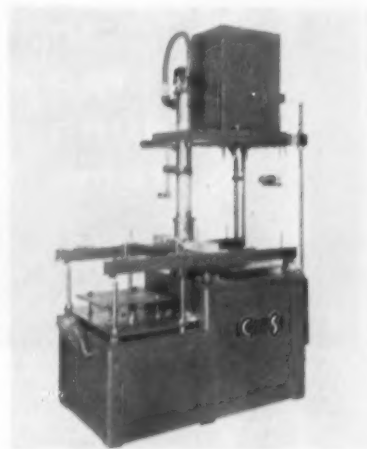
Machine produces shell molds and shell cores

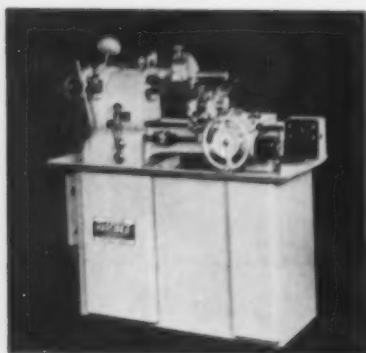
Both shell molds and shell cores can be produced separately or simultaneously on the Blo-Core shell machine, Model W-1520. It utilizes the principle of blowing, at low pressures, resin coated sands into heated core boxes to produce shell cores. Shell molds can be produced by blowing into heated patterns or die cavities. Curing commences immediately and within 20-30 sec cores or molds are ready for use. By the use of multiple cavity core boxes, production rates as high as 240 cores per hr are easily attainable. In core making, drier plates

and ovens are completely eliminated. Production is accomplished within a small area, and only unskilled labor is required. In the blowing of shell molds, the machine is said to double mold production and blowing into heated pattern cavities produces contoured shell molds. Standard machine accommodates core boxes, or patterns, up to 15 x 20 x 36 in. high. It is easily adaptable to either horizontal or vertical partings. *C & S Products Co.*

For more data circle No. 34 on postcard, p. 141.

Turn Page





Chucking machine features 3-selector variable drive

Increased production, wider range, and ease of operation are advantages of new chucking machines with 3-selector variable drive. A 3-position speed control lever at the headstock permits the operator to shift instantly from one speed to another without stopping the machine. Any three separate speeds within the 125 to 3000 rpm range of the machine may be preselected by adjusting master cams located

just inside the motor compartment door. Model HTC features a single-point production threading head. With one lead screw and follower plus a $\frac{3}{8}$ in. square tool bit, any diameter thread of the same pitch can be cut at high production speeds. The HC Model is available without the threading head for work not requiring threading. *Hardinge Brothers, Inc.*

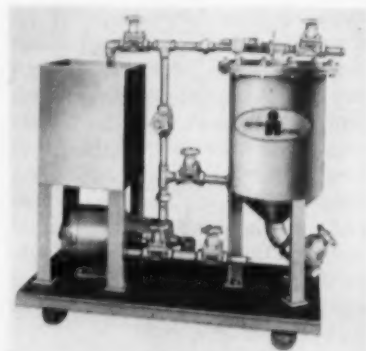
For more data circle No. 35 on postcard, p. 141.

Pressure filter for the plating industry

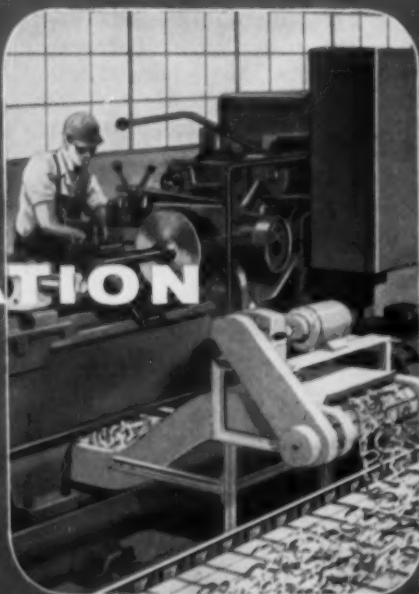
A self-cleaning pressure filter removes sludge formed by dissolving electrodes and prevents dust, dirt and oil contamination of metal parts during plating operations. The filter uses a stainless steel wire-wound cylinder which supports the filter media; is non-corrosive; and speeds up the filtration process. Features include: a new backwashing device which accomplishes the filter cleaning by

turning two valves; filtration at high pressure without leakage; tank capacities up to 5000 gal; and a longer filtration cycle made possible by the increasing density of the filter cake. The complete assembly can be mounted on a common base and transported to filtration areas anywhere within the plant. *U. S. Hoffman Machinery Corp.*

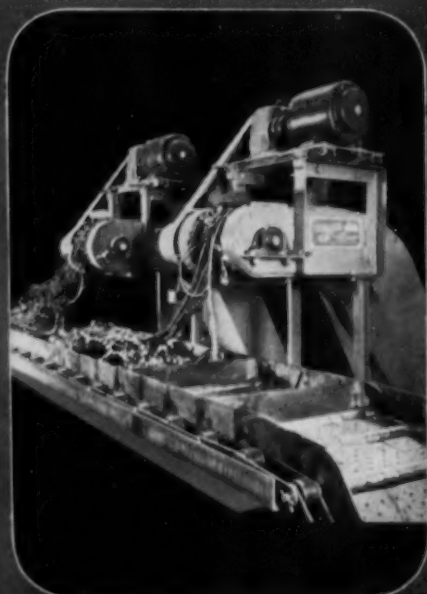
For more data circle No. 36 on postcard, p. 141.



May-Fran
... first
for
AUTOMATION
in
scrap
handling
systems



The CHIP-TOTE conveyor permits complete utilization of machine tools by eliminating shut-down for manual scrap removal.



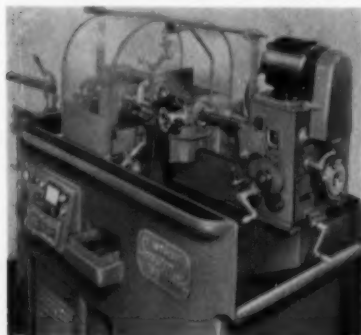
It handles a continuous flow of hot, wet or dry chips, turnings and borings from any multiple spindle automatic machine.

Light-duty nibbler cuts 18 gage stainless steel

A new nibbler is said to cut all types of stainless steels with equal facility, and light plate or sheet stock of cold-rolled steel, aluminum, copper, galvanized metals. It is handy for cutting irregular, rounded, or special shapes and will cut contoured stock without damage to the original contour. Using a punch and die action, the nibbler removes a tiny slug of metal with each cutting stroke. All cuts are clean, without distortion, burrs,

or elongation on either side. The nibbler is maneuvered as a hand tool or can be vise-mounted for bench operation. It cuts at the rate of 43 ipm, from any angle, with a minimum cutting radius of $\frac{7}{8}$ in. Motor is the universal type. Gears are precision hardened, and all rotating parts have anti-friction bearings. Punch and die are replaceable and can be sharpened as needed. *Fenway Machine Co.*

For more data circle No. 37 on postcard, p. 141.



Bar stock to 0.750 OD machined on Screwmatic 750

Through new design principles, performance of the Detroit Screwmatic 750, a single spindle, bar automatic screw machine, is said to bring lowered costs and increased production of short, medium and long parts of every degree of precision and complexity. A heavy duty, 5 hp motor and advanced spindle design permit speeds sufficient to machine all types of materials with carbide tools. Spindle

speeds are infinitely variable and three different forward speeds may be employed during any cycle of work. All speeds are reversible. Staying accuracy of closest tolerances in forming is assured by heavy section cross slides and direct cam activation. Six position turret is provided for end working tools. *Gear Grinding Machine Co.*

For more data circle No. 38 on postcard, p. 141.

Turn Page



Hinged-steel belting handles scrap as well as hot heavy and abrasive castings. Belt is economical . . . maintenance-free.

Now is the time to put AUTOMATION to work . . . Now is the time to cut production costs . . . May-Fran engineers design and build complete scrap handling systems for the automatic removal of machine turnings or chips. May-Fran conveyors will transmit scrap to ultimate point of disposal.

Press Scrap systems can be made completely automatic. Hinged-steel belt will take scrap from presses, handle it through blanking, shearing, forming and baling processes, and deliver it to rail cars.

May-Fran is prepared to engineer, fabricate and install complete conveyor systems to your specifications.

DESIGNERS AND ENGINEERS
OF COMPLETE SCRAP
HANDLING SYSTEMS

MAY-FRAN

ENGINEERING, INC.

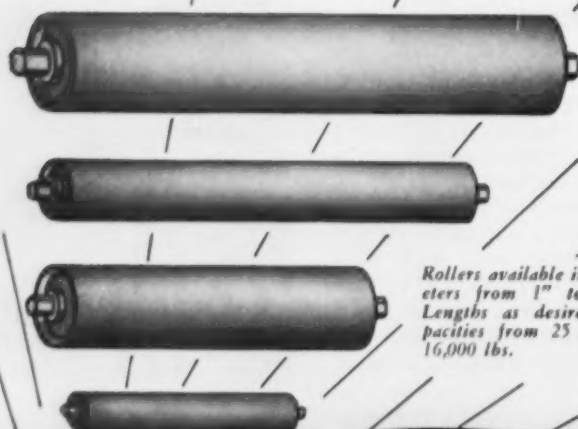
Write today for complete information on how an automatic scrap removal system will cut your production costs.

Bulletin MF-530 describes the new Hinged-Steel conveyor belt.

Bulletin MF-640 describes the Chip-Tote conveyor which removes scrap from operating machines.



1698 CLARKSTONE ROAD
CLEVELAND 12, OHIO



Rollers available in diameters from 1" to 6 1/2". Lengths as desired. Capacities from 25 lbs. to 16,000 lbs.

ROLLERS FOR MANY PURPOSES



All rollers with 7/16" hexagon shafts or larger are equipped with Logan new low-friction X-Series bearings at no extra cost.

Logan Rollers are designed primarily for use in Roller Conveyor, but are suitable for many other purposes. Examples are machine parts, feed and guide rolls, truck beds, coil boxes, etc. Rollers are tubular type with ball bearings and either round or hexagon shafts. Bearings can be plain, dust protected, grease packed, or pressure lubricated.

Further information on request.

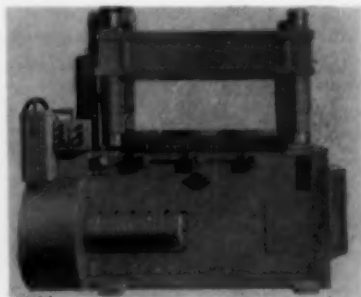
Logan Conveyors

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

NEW EQUIPMENT

100-ton production press

This 100-ton press is equipped with a four speed operating control mechanism permitting a choice of 40, 50, 60 or 80 strokes per min. It is only 7 ft high and occupies 75 x 84 in. floor space. Bed area and clearance are large in relation to the tonnage. There is complete clear-

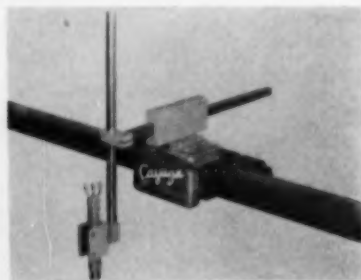


ance between the posts from f to b and r to l. The drive mechanism is housed in the base and pulls the head down, eliminating overhead thrust and assuring perfect alignment by both punch and die. The press has forced feed lubricating system, herringbone back gear and an air clutch. Safety pushbutton controls and one emergency stop button make the press safe to operate. *Alpha Press & Machine, Inc.*

For more data circle No. 39 on postcard, p. 141.

Portable seam welder

New seam welder is easily handled by one man and is designed to take the welder to the workpiece, eliminating setup time. It will weld seams from 5 to 20 ft long; has a



speed range of 15 to 1. It is a self-contained unit with its own rail supported by either tripods or magnetic clamps. A Cayuga-Matic seam follower is designed for use with this seamer. *Cayuga Machine & Fabricating Co., Inc.*

For more data circle No. 40 on postcard, p. 141.

Turn Page



In soaking pits, Johns-Manville Sil-O-Cel C-22 Insulating Brick provide outstanding performance as back-up insulation.

Specify

Johns-Manville SIL-O-CEL C-22 Insulating Brick

the diatomaceous silica brick that retains its high cold crushing strength of 700 psi throughout normal service range

Because of its exceptional strength Sil-O-Cel C-22 Insulating Brick has gained wide acceptance as an all-purpose insulating brick. It is especially recommended for soaking pits, open hearth bottoms, slab heating furnaces, hot blast stoves, coke ovens and other high temperature equipment.

Millions of microscopic cells provide Sil-O-Cel C-22 brick with excellent heat resistance up to 2000F. It has a thermal conductivity of only 1.88 Btu in/sq ft/F/hr at 1000F mean temperature. In addition, with a density of 38 lb/cu ft, it is light and easy to handle.

For direct exposure or back-up to 1600F, use Sil-O-Cel 16L Insulating

Brick. This newest member of the J-M diatomaceous silica insulating brick family has less than 0.1% reversible thermal expansion at 1600F. Conductivity is 1.07 Btu in/sq ft/F/hr at 1000F mean temperature with a density of 33-35 lb/cu ft. Cold crushing strength is 350 psi. Sil-O-Cel 16L serves equally well as back-up insulation or exposed refractory lining.

For back-up at higher temperatures, specify Sil-O-Cel® Super Insulating Brick with an unusually high temperature limit of 2500F.

Write today for further information on Sil-O-Cel Insulating Brick and Insulating Fire Brick. Ask for Brochure IN-115A. Address Johns-Manville, Box 60, New



York 16, N. Y. In Canada, 565 Lakeshore Road East, Port Credit, Ontario.



Johns-Manville *first-in* **INSULATION**
MATERIALS • ENGINEERING • APPLICATION



Straightening press handles plates and weldments

The traveling gantry and traveling ram on this 400-ton vertical hydraulic straightening press make it possible to straighten plates or weldments without moving the piece being straightened. Also the gantry can be moved to one side of the bed for easy removal of the completed work. Bed measures 20 x 13 ft and daylight opening, bottom of ram to bed is 48 in.

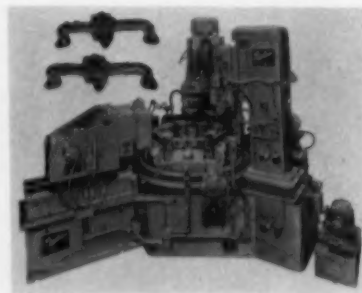
maximum. Stroke is 24 in.; cross travel of hydraulic ram 10 ft 10 in.; longitudinal travel of gantry, 15 ft; speeds, ram down, 37 ipm, full pressure, 12 ipm. Control buttons are mounted on both housings. Paralleling racks underneath bed, mesh with pinions on cross shaft to maintain gantry alignment. *Williams-White & Co.* For more data circle No. 41 on postcard, p. 141.

Twenty-three operations per 18 sec on manifolds

This Buhr 5-way dial-type hydraulic-feed Special mills, drills, counter-sinks and individual-lead screw taps 206 intake manifolds an hour gross. It is equipped with a 60-in. diam 6-position automatic index table, complete with shot bolt. One of its features is a rotating chip conveyor, attached to index. This mechanism disposes of chips auto-

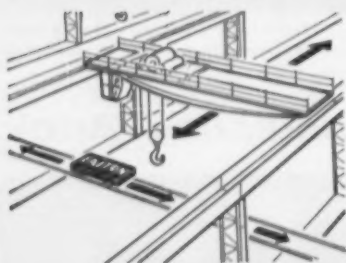
matically. Parts are loaded one per station in each of six single-place fixtures. A power wrench with torque control, automatically operates the clamping mechanism. Complete interchangeability of parts is accomplished by Buhr's precision manufacturing technique. *Buhr Machine Tool Co.*

For more data circle No. 42 on postcard, p. 141.



Cross-Bay Transfer

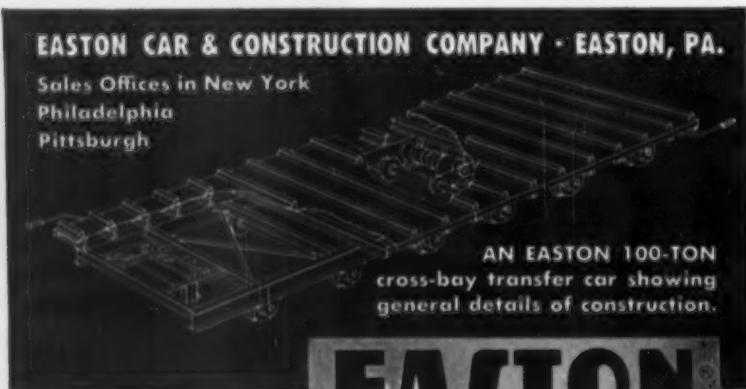
TRADE MARK



The EASTON motorized cross-bay transfer car is designed to provide lateral handling of materials to supplement overhead crane service in modern multiple bay plants. The cross-bay movement of the automatic transfer car provides a universal handling system able to spot a load anywhere on the floor of the plant. The same car system may also be used for moving materials between plant buildings.

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

Sales Offices in New York
Philadelphia
Pittsburgh



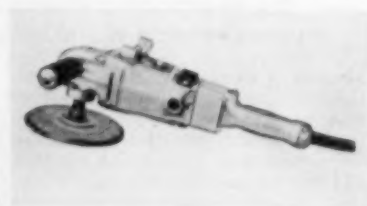
AN EASTON 100-TON cross-bay transfer car showing general details of construction.

EASTON

A-1046

More power, less weight

New 7-in. standard sander is said to possess 20 pct more power than its predecessor, yet weight has been reduced by 20 pct. Its motor has been redesigned and built for general purpose maintenance and production work. New type centrifugal fan affords greater air velocity through the commutator



section so that the motor runs cool and is kept almost free of carbon and abrasive dusts. Balance is improved and handle has been redesigned for a more comfortable grip. Heat-treated spiral bevel gears give a smooth, constant transmission of power from motor to spindle. Universal motor drives sander at 4250 rpm. *Black & Decker Mfg. Co.*

For more data circle No. 43 on postcard, p. 141.

NEW EQUIPMENT

Rust-preventive fluids

A series of rust-preventive fluids for coating metal parts before storage can be burned cleanly from metal surfaces after storage, leaving no residues to interfere with painting, welding, soldering, brazing, or annealing. Brand-named Ucon, the coatings can be removed with solvents or, in some cases, by mild scouring with water. They have negligible solvent or swelling effects on various types of rubber. Carbide & Carbon Chemicals Co.

For more data circle No. 44 on postcard, p. 141.

Heat treating furnace

A new protective atmosphere is used in a new general purpose heat treating furnace for hardening of tool steels, carburizing, etc. The



atmosphere system consists of a cracking unit to which is fed, by means of a variable speed pump, a mixture of alcohol and water proportioned according to the type of treatment desired. This mixture is cracked into gas of a controlled analysis to maintain the correct carbon potential for equilibrium with the steel being treated. To insure a complete seal, the furnace is equipped with an inconel retort which has a welded thermocouple well and a welded pipe extension to provide for gas admission. At the front, door is tightly sealed against the retort face. Chamber measures 8x6x14 in. Cooley Electric Mfg. Corp.

For more data circle No. 45 on postcard, p. 141.

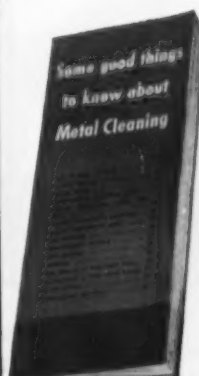
Turn Page

Which of these jobs gives you trouble?

Oakite chemists have developed efficient new materials for the six important jobs listed below. One of these new materials may provide the perfect solution for your most difficult problem.

- 1 HEAVY-DUTY CLEANING IN TANKS:** New material combines the best qualities of alkaline and solvent cleaners.
- 2 PHOSPHATE COATINGS:** One material cleans steel while applying dense iron-phosphate coating. Another surpasses government specifications for heavy zinc-phosphate coatings. Lasting paint adhesion, protection against corrosion, ease of control.
- 3 ETCH-CLEANING ALUMINUM:** Uniform etching in preparation for anodizing or painting. Scaling and sludging minimized or eliminated.
- 4 ELECTROCLEANING BRASS:** Efficient, economical cleaning without danger of tarnish.
- 5 INHIBITING PICKLE BATHS:** Liquid inhibitor for sulphuric, hydrochloric and phosphoric acids. Saves steel, saves acid, builds own foam blanket to suppress pickling fumes. Easy to add to continuous strip or batch pickling operations.
- 6 STRIPPING PAINT:** Two solvent strippers for synthetic enamels and other tough finishes. One so viscous it adheres to vertical surfaces of objects that can't be stripped any other way.

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to
help you



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Circle the coupon number corresponding to the job that gives you trouble. We'll send information about the new material for the work, also our 44-page illustrated booklet "Some good things to know about Metal Cleaning."

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Send me a FREE copy of "Some good things to know about Metal Cleaning" and tell me more about the new Oakite material for the job (jobs) corresponding to the number (numbers) I've circled below.

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QUALITY and SERVICE

more tonnage per edge

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HOMESTEAD, PENNSYLVANIA

ARMSTRONG *Carbide* TOOL HOLDERS



**For
Higher
Speeds,
and Heavier
Feeds**

Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachinable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

Write for Catalog

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5209 WEST ARMSTRONG AVE., CHICAGO 30, ILLINOIS
NEW YORK SAN FRANCISCO



Versatile pallet loader

A wide variety of units can be speedily stacked with this new pallet-loading machine. The stacker operating on a simple suction-pick-up principle lifts the units in much the same manner as an electro-magnet handles ferrous materials. It is fed from a conveyor line and the pattern-laying



is pushbutton controlled by an operator. Various stacking patterns may be obtained. In palletizing the machine will handle an average of twelve 100-lb bags per min, discharging them onto either of two pallet stations. The machine is equally suitable for unloading pallets and feeding packages onto a conveyor line. *Alvey Conveyor Mfg. Co.*

For more data circle No. 46 on postcard, p. 141.

Coolant separators

Delpark-Dings magnetic coolant separators remove metal particles from coolant by magnetic attraction. Units may be used inde-



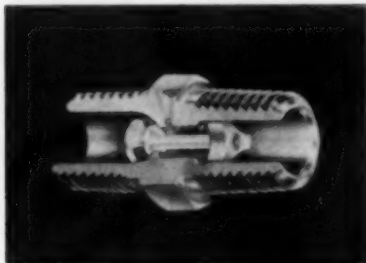
pendently where partial separation is adequate; may also be used for pre-filtration separation to reduce load on the filter. The separators are made in capacities to 100 gpm. *Industrial Filtration Co.*

For more data circle No. 47 on postcard, p. 141.

NEW EQUIPMENT

Liquid or gas check valve

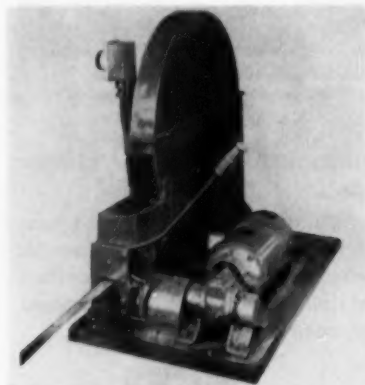
New 2300 Series check valve is a leak-proof, low cost valve for the 0-1000 psi range. Floating poppet design is not affected by foreign particles in the fluid and eliminates wire drawing across the seat. The spherical metal seat as-



...sures perfect seating and support for the O ring which serves as a sealing member and absorbs the closing shock. The valve is available in several body and O-ring materials combination to provide a versatile dead tight sealing check valve for virtually any liquid or gas service. *James-Pond-Clark.*
For more data circle No. 48 on postcard, p. 141.

Power coil dispenser

An electrically-operated steel strapping dispenser for rapid handling of shipments is equipped with a magnetic brake for instantaneous stopping and to prevent overruns. Available with or without shear,



depending on the need for cut lengths or continuous strapping, this pushbutton dispenser is designed in three models to handle full coils of 3/4, 1 1/4, and 2-in. steel banding. It dispenses at rate of 250 fpm. *Allegheny Steel Band Co.*

For more data circle No. 49 on postcard, p. 141.

**Another First for
KRANE KAR
A SILENT HOIST
EXCLUSIVE!**

Ask about
the New
Lease-a-KRANE KAR-Plan
... 1 to 3 Year Lease
with Option to
Purchase.

Silent Hoist gave you **KRANE KAR**, the first modern Mobile Crane ... Front-Wheel Drive ... Stability without Stabilizers ... Lifetime Front Axle ... Automatic Safety Controls. And now **Silent Hoist** gives you **FLUID DRIVE!**

- ✓ Increases engine clutch life.
- ✓ Provides cushioned starting and acceleration.
- ✓ Eliminates overload shock damage to drive gears.
- ✓ Speeds operation.
- ✓ Cuts maintenance drastically.

Ask for Bulletin No. 79C

"Silent Hoist" **KRANE KAR** Swing-Boom Mobile Crane ... 1 1/2, 2 1/2, 5, 10, 12 1/2 Ton Capacities

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Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.

Perforations perplexing you?

MASONITE? PLASTIC?
METALS? RUBBER?



If you have a design problem that's got you down maybe Hendrick can be of help. Sometimes the easiest and quickest way to enhance a product's beauty is to include a pleasing pattern of perforations in its design. Hendrick perforated metal not only helps increase a product's overall attractiveness, but also adds to its saleability as well. And whatever material you're using ... whether its metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes, you can draw on Hendrick's long experience and perforating facilities to fill the bill. Write for details.

...better call HENDRICK

Hendrick
MANUFACTURING COMPANY



37 DUNDAFF STREET, CARBONDALE, PA. Sales Offices in Principal Cities
Perforated Metal • Perforated Metal Screens • Wedge-Slot and Wedge Wire
Architectural Grilles • Mitco Open Steel Flooring • Shor-Site Treads • Armorgrids



A Claymont steel plate being swung into place during the construction of new-type prefabricated all-steel dock at the plant of The Pusey and Jones Corporation, Wilmington, Del. This steel pier is 460 feet long and weighs 1300 tons. Twelve hundred tons of Claymont steel went into its construction.

New prefabricated all-steel dock uses **CLAYMONT STEEL PLATES** *throughout*

The only all-steel pier-type dock of its kind in the United States, this prefabricated giant was built by Pusey and Jones Corporation at its plant in Wilmington, Del. Launched in two sections from the Pusey and Jones plant, it was towed down Delaware Bay, and up the coast to New York Harbor for installation at the Astoria, L. I. generating station of the Consolidated Edison Co. It supports a coal unloading tower with an 850-ton per hour capacity.

Built of Claymont steel plates throughout, this type of prefabricated steel pier has important advantages over other types of construction. Many months of costly construction time are saved. Fabrication costs are considerably less than concrete construction. Installation is quick and easy. Years of trouble-free service are assured.

This is a patented engineering achievement of a specialized nature. But the concept of *prefabricated all-*



First of two sections of prefabricated all-steel pier being launched at Wilmington for towing to New York.

steel construction may well be adaptable to other industrial applications.

You'll find at Claymont the skills and facilities to translate pioneering design into advanced developments for industry. Whether your requirements are for carbon or alloy steel plates, stainless-clad plates or customized flame-cut shapes, Claymont can meet your needs.

Claymont Steel Products



Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

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2937

The Iron Age SUMMARY...

No summer letup seen in the cards . . . If one comes it will be far smaller than expected . . . Carryovers are increasing.

No Summer Easing . . . It's beginning to look like the expected summer easing of the steel market will not be of much comfort to consumers.

As the market now stacks up, seasonal factors now coming into play will take up the slack should other major consuming industries ease up on their requirements.

Also, carryover tonnages are running stronger than either mills or steel users had anticipated. Deliveries are running behind schedule on many products, particularly sheets and plates. On top of this a heavy influx of orders is building up for structurals, oil country goods, and line pipe.

Shortages Coming Up . . . Some spot shortages are developing. These include seamless casing for oil well drilling. This, in turn, has resulted in substitution of electric-weld pipe which increases the burden on plate-producing capacity.

Pressure Mounts . . . Meanwhile, the pressure on mill production and delivery facilities continues to mount. Seasonal factors are coming into the picture in a big way. Farms, construction, oil well drillings, and linepipe projects are competing with automotive, appliances, and can companies as well as export for available supplies.

The mills are hard pressed to maintain delivery promises. Carryovers on some products already are running 3 weeks to a month behind. A midwestern producer is accepting no orders for sheets for July delivery because he needs time to get his schedules straightened out.

There may be some relief during the summer, but not much. Where one industry eases, the other will take up the slack. Plant vacation shutdowns will be held to a minimum. Metalworking firms are too busy to take extra time off. Last year, vacation closings contributed to the decline in steel demand.

Strike Unlikely . . . Even a strike in automotive, which seems unlikely, would not hurt steel production much. Other industries will absorb the freed tonnage, if any. Besides, some car producers would accept delivery during a strike-incurred shutdown. They're thinking ahead to requirements for new models which will go into production in third and fourth quarters.

Steel mills this week will operate at 95 pct of capacity, and will produce close to 2.3 million ingot tons. This is slightly below the record set the week of March 23 last year. Last week's operating rate was 94.5 per cent of capacity.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week†	Last Week	Month Ago	Year Ago
2,292	2,279	2,231	1,652	
Ingot Index (1947-49=100)	142.5	141.8	138.8	102.8
Operating Rates				
Chicago	95.8	97.0	97.0	78
Pittsburgh	97.0	97.0*	94.0	81
Philadelphia	96.0	94.5	91.0	67
Valley	95.0	95.0*	92.0	60
West	94.2	98.0*	92.5	72.5
Detroit	91.0	91.0	90.0	74.0
Buffalo	104.9	100.0*	100.0	63.5
Cleveland	98.9	102.4	97.0	60.5
Birmingham	90.5	87.5	86.5	78.5
S. Ohio River	90.4	91.0*	76.0	73.0
Wheeling	95.0	90.0*	98.0	86.0
St. Louis	95.2	95.0	96.0	43.5
Northeast	97.5	82.0	84.0	40.0
Aggregate	95.0	94.5	92.5	69.0

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (Gross ton)	\$56.59	\$56.59	\$56.59	\$56.59
Scrap, No. 1 hvy (gross ton)	\$37.00	\$37.00	\$37.58	\$24.50
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	21.50
Copper, electrolytic	36.00	36.00	33.00	29.875
Lead, St. Louis	14.80	14.80	14.80	13.55
Magnesium, ingot	29.25	29.25	27.75	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	90.75	91.25	90.625	94.50
Zinc, E. St. Louis	11.50	11.50	11.50	10.25

Demand Up for All Products

Structurals, wire products, bars lead parade . . .

Greater competition for available ingots . . . Mill shipping facilities pressed to meet deliveries.

♦ **IMPACT** of seasonal demand is increasing pressure for products used in construction and on the farm. These include structurals, merchant wire products, reinforcing bars, and construction wire.

Coupled with already-heavy demand for other products, the seasonal upsurge increases competition for a share of available ingots. And with the mills operating at capacity or slightly below, the pressure on production and shipping facilities becomes more intense.

There's scarcely a product that could be considered easy. If anything, demand is strengthening for bars, plates, sheets, strip, stainless, electrical and enameling sheets, galvanized, oil country goods, and linepipe. Warehouse demand also is improving. Some distributors have been forced to reserve their secondary sheets for regular customers, turning down the Johnny-come-latelies who are trying to pick up their requirements where they can.

Pressure for deliveries is taxing shipping facilities of the mills. Some producers report difficulty lining up enough trucks, and in some cases freight cars, to keep shipping docks clear. This is contributing to the delay in deliveries and increasing restiveness of consumers caught off base by the upturn in steel demand.

In plate and some other products, producers have been forced to extend delivery dates.

SHEETS AND STRIP . . . Third quarter bookings on cold-rolled sheets is now the rule in many districts. In the East, one major producer is looking for a tight strip supply to develop in third quarter. In Pittsburgh, consumers are a little better off now than they were a few weeks ago. Orders placed in late January and February

although arriving late are steady. This is also reflected at warehouse level where demand for sheets is tapering off. Automakers are still setting the pace in Detroit. Demand is expected to hold up at least through July. One mill still has not accepted any third quarter orders. Flat-rolled is rationed for third quarter in all lines in Chicago. There's a carryover on cold-rolled sheets, and to a lesser extent, on hot-rolled sheet through the remainder of second quarter.

McLouth Steel Corp., Detroit, has brought finishing capacity into line with its 1.2 million tons ingot capacity with the completion of a new cold-rolling mill at Gibraltar, Mich. The new facility is located near the company's Trenton plant. It will roll sheet in widths up to 56 in.

BARS . . . There's still no letup in demand for cold-finished and carbon bars in Detroit. One firm reports that lead time has been upped to 90 days. Very few orders have been placed for third quarter. In Cleveland, cold-finished bar orders are picking up very well with deliveries now out to 4-7 weeks. Pittsburgh reports that one mill is booking into third quarter and alloy bars are being extended. In the East, one large producer is showing a 70 pct increase in March bookings over January and February. There's brisk demand from all quarters.

Purchasing Agent's Checklist

ELECTRICAL EQUIPMENT: Sales this year should top 1954 by 15-20 pct . . . p. 86

STEEL: Earnings good despite '54 slump. Net income off only 13.2 pct . . . p. 92

ASIAN AID: New program will call for about \$2 million for economic, military aid . . . p. 101

STAINLESS . . . Market continues strong in Detroit with automotive demand the major factor. Few third quarter orders have been placed as yet.

PLATES . . . In the East, sheared plate is booked through the first half for one large producer. He's accepting May and June orders for continuous plate. Cleveland reports that consumers are pressuring warehouses in an effort to get plate. One major supplier has pushed May into June, June into July and the end is not in sight. In Pittsburgh, plate is tighter than ever. Mills are behind on delivery promises.

STRUCTURALS AND SHAPES . . . One producer in the East reports his shapes are booked through May. He was booked through April on shapes last week. Structurals in general continue strong. Pittsburgh reports that one mill is booking light structurals well into third quarter. On the West Coast, structural business is picking up, but mills are not yet operating at capacity.

PIPE AND TUBING . . . In Chicago, tubing and casing for oil country is moving out as predicted. Now at 90-120 days delivery and users are switching from seamless to electricweld. Orders are so large that electricweld is not much better on delivery than seamless. Buttweld and lapweld is spotty, but is out to as much as 60 days delivery, depending on mill. Merchant, oil country and linepipe lead the way in Pittsburgh. In the East, one producer cites March as a top month for his pipe business.

WIRE PRODUCTS . . . Seasonal surge on welded wire fabric for road-building is reported from Cleveland. New order deliveries now running 10-13 weeks. Chicago reports wire sales levels higher than a year ago with a second buying wave for merchant products seen in about 30 days. Manufacturing wire strong. In Detroit, spring wire demand is good. One firm reports fencing demand is up 10 pct over same time last year. Most mills booked through June for seat and valve springs. April bookings are still being taken by one producer in the East for rods and wire. Another producer reports his merchant wire is running 1-4 weeks delivery. His manufacturers wire is now at 8-10 weeks. No extremely heavy demand is noted and third quarter business is being accepted.

Comparison of Prices

(Effective Apr. 5, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Apr. 5 1955	Mar. 29 1955	Mar. 8 1955	Apr. 6 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.65	4.65	4.65	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.25	4.25	4.25	4.10
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. ternes	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.20
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Nails: (per 100 lb.)				
Heavy nails	\$4.45	\$4.45	\$4.45	\$4.325
Light nails	5.35	5.35	5.35	5.20
Semifinished Steel: (per net ton)				
Re-rolling billets	\$64.00	\$64.00	\$64.00	\$62.00
Slabs, re-rolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	85.00	85.00	85.00	82.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.707¢	4.707¢	4.707¢	4.634¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Apr. 5 1955	Mar. 29 1955	Mar. 8 1955	Apr. 6 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$61.19	\$61.19	\$61.19	\$61.19
Foundry, Valley	58.55	58.55	58.55	58.55
Foundry, Southern, Cla'd	58.45	58.45	58.45	58.45
Foundry, Birmingham	52.55	52.55	52.55	52.55
Foundry, Chicago	54.55	54.55	54.55	54.55
Basic, del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Malleable, Chicago	54.50	54.50	54.50	54.50
Malleable, Valley	54.50	54.50	54.50	54.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢
‡ 74-76 pct Mn base.				

Pig Iron Composite: (per gross ton)				
Pig iron	\$56.59	\$56.59	\$56.59	\$56.59

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$38.50	\$38.50	\$38.50	\$25.50
No. 1 steel, Phila. area	27.00	27.00	39.75	21.50
No. 1 steel, Chicago	35.00	35.00	34.50	26.50
No. 1 bundles, Detroit	29.00	29.00	39.00	17.50
Low phos., Youngstown	37.50	37.50	37.50	27.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	43.50	41.50
No. 1 mach'y cast, Philadel'a	44.50	44.50	44.50	39.50
No. 1 mach'y cast, Chicago	47.00	46.50	45.50	37.50

Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$37.00	\$37.00	\$37.58	\$24.50

Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.88	\$14.88	\$14.88	\$14.88
Foundry coke, prompt	16.75	16.75	16.75	16.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	36.00	36.00	33.60	29.875¢
Copper, Lake, Conn.	36.00	33.00	33.00	30.00
Tin, Straits, New York	90.75	91.25	90.625	94.50
Zinc, East St. Louis	11.50	11.50	11.50	10.25
Lead, St. Louis	14.80	14.80	14.80	13.55
Aluminum, virgin ingot	23.20	23.20	23.20	21.80
Nickel, electrolytic	67.67	67.67	67.67	63.04
Magnesium, ingot	29.25	29.25	27.75	27.75
Antimony, Laredo, Mex.	25.50	25.50	25.50	25.50
† Tentative. ‡ Average. * Revised.				

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

—To identify producers, see Key on P. 187—

Base price cents per lb. f.o.b. mill

Producing Point	Basic	Fdry.	Mall.	Base.	Low Phos.
Bethlehem B3	58.00	58.50	59.00	59.50	
Birmingham B3	52.38	52.88			
Birmingham W9	52.38	52.88			
Birmingham U4	52.38	52.88	56.50		
Buffalo B3	56.00	56.50	57.00		
Buffalo T11	56.00	56.50	57.00		
Buffalo W6	56.00	56.50	57.00		
Chicago 14	56.00	56.50	56.50	57.00	
Cleveland A5	56.00	56.50	56.50	57.00	61.00
Cleveland R3	56.00	56.50	56.50		
Dalingerfield L3	52.50	52.50	52.50		
Duluth 14	56.00	56.50	56.50	57.00	
Erie 14	56.00	56.50	56.50	57.00	
Everett M6		61.00	61.50		
Fantana K1	62.00	62.50			
Ganona, Utah C7	56.00	56.50			
Granite City G2	57.90	58.40			
Hubbard V1	58.00	58.50	59.00		
Minneapolis C6	58.00	59.00	59.00		
Monacaon P6	56.00				
Neville Isl. P4	56.00	56.50	56.50		
N. Tonawanda T1		56.50	57.00		
Pittsburgh U1	56.00			57.00	
Sharpsville S3	56.00	56.50	56.50	57.00	
So. Chicago R3	56.00	56.50	56.50		
Steelton B1	58.00	58.50	59.00	59.50	
Swedeland A2	58.00	58.50	59.00	59.50	
Talede 14	56.00	56.50	56.50	57.00	
Troy, N. Y. R3	58.00	58.50	59.00	59.50	64.00
Youngstown Y1		56.50	57.00		

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 8.75 and over.
Silvery iron: Buffalo, W1, \$64.25; Jackson, J1, G1, \$65.00. Add \$1.00 per ton for each 0.50 pct silicon over base (0.01 to 0.50 pct) up to 17 pct. Add \$1 per ton for 0-75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are \$1 over comparable silvery iron.

Product	301	302	303	304	316	321	347 Cb	410	416	430
Ingot, re-rolling	16.75	17.75	19.25	19.80	29.75	23.50	35.50	14.00	—	14.25
Slabs, billets, re-rolling	21.00	23.25	25.25	24.50	30.00	30.25	46.75	18.25	—	18.5
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.75	46.25	—	31.00	31.75	31.7
Billets, forging	30.00	30.25	22.75	31.75	48.25	30.00	54.75	24.00	24.50	24.5
Bars, wires, structurals	35.75	36.00	35.75	38.00	57.25	42.75	64.25	28.75	29.25	29.2
Plates	37.75	38.00	40.25	40.50	60.50	46.50	69.25	30.00	30.50	30.5
Sheets	41.75	42.00	49.25	44.50	64.00	51.25	77.00	34.25	41.25	34.7
Strip, hot-rolled	30.25	32.50	27.25	35.00	55.00	41.75	63.00	26.25	—	27.0
Strip, cold-rolled	38.75	42.00	46.00	44.50	64.50	51.25	77.50	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J2; Baltimore, Md., E1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, Ind., J4; Philadelphia, D3.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Lechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, A2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb higher) W1 (25¢ per lb higher); New Bedford, Mass., B6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ind., A5; Canton, O., T3; Ft. Wayne, Ind., J4; Philadelphia, D3.

Wire: Waukegan, Ind., A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monacaon, Pa., U1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Middletown, A7; Washington, Pa., J4; Cleveland, Massillon, R3; Coatesville, Pa., C15; Philadelphia, D3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Fordalt, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11.

U. S. Defers Export Action

Current rules covering scrap export will hold while further study is made . . . Decision expected to tighten market further . . . Chicago leads domestic buying.

♦ **COMMERCE** Dept. has announced that no change will be made at this time in the government rules on iron and steel scrap exports. Action has been withheld pending further study of the supply-demand situation.

Under existing rules, an exporter holding outstanding licenses may apply for additional licenses on a cargo-for-cargo basis against shipments he made on or after Feb. 21. An exporter who holds no license may apply to export a quantity not exceeding a maximum cargo lot on a single carrier.

THE IRON AGE Heavy Melting Steel Scrap Composite held at \$37.00 this week.

Pittsburgh . . . Scrap seems to be more plentiful recently particularly secondary grades. Brokers report an abundance of No. 2 bundles at current prices. A tonnage of industrial bundles was sold at approximately \$40 per ton for delivery to a consumer close at hand. Considering freight charges, these bundles cost the consumer considerably less than last month. A large consumer is regulating shipments to a district plant on a scheduled basis.

Chicago . . . Brokers buying prices inched upward despite mill resistance to higher prices. Broker bidding on factory bundles moved up again last week and tightened bundles in this grade at the bottom of the spread. The general factory bundle outlook is very strong. Showing continued strength are electric furnace turnings and railroad grades as well with dealers holding a stiff price line in all categories. No. 2 bundles continue to lag in the market though No. 2 heavy melting is very strong. The foundry market continues to show strength as inventories built up during the low price period last year are depleted.

Philadelphia . . . Price of No. 1 heavy melting for the district remains at \$37.50 tops. There is some smaller quantity buying at higher prices. Market is generally quiet and there is apparently plenty of scrap available at present for both export and domestic requirements. Current regulations governing scrap export still hold while further study is made in Washington. Failure to impose restrictions on exports at this time is expected to tighten the market.

New York . . . Prices held firm in the New York area with vigorous activity marking the week and no letup in sight. New York scrap dealers are protesting proposed increases in scrap export carload rate from certain points in New York to the loading docks in New Jersey. New rates, up as much as \$1 per gross ton, would hit yards not able to load by barge.

Detroit . . . A local mill (Great Lakes) made a buy here this week on a \$29.50 f.o.b. Detroit basis. The new automotive lists remained about the same as last month. Split bids on some lists were reported, indicating a degree of caution on the part of the buyers. Brokers might have been willing to accept additional tonnages, but they wanted it at a given price.

Cleveland . . . Mill buyers are using every available means of preventing a runaway scrap market in Cleveland and the Valley. Meanwhile they are placing some orders for moderate tonnage. One Valley mill last week bought blast furnace turnings at \$27 or \$1 over prevailing top market price but restricted shipping points to industrial plants. Another in the Cleveland area also restricted shipping points on blast furnace. Another Valley mill bought special grade open hearth, then held up shipments at week's end. Ford foundry placed substantial order for regular 2 ft 1/4 in. and over foundry steel at top market

price of \$41.50. Dealers are having difficulty buying in view of price pressures and brokers are generally buying only 30 days in advance compared to normal 60 to 90.

Birmingham . . . Exports continue to be the dominant pushing factor in the steel scrap market in this district. The scarcity of No. 2 heavy melting is becoming acute and brokers once again are reported scrambling for it at prices as high or higher than they are getting. Bundles continue to be the dog of the market. Some foundries report difficulty in getting raw materials due to the railroad strike, but none have thus far been forced to cut back production.

St. Louis . . . Steel mills are committed for most of their estimated melt for well into April and the scrap market is steady at unchanged prices. A Kansas City consumer issued buying prices at present levels. The movement of material continues steady, being equal to or slightly more than the melt.

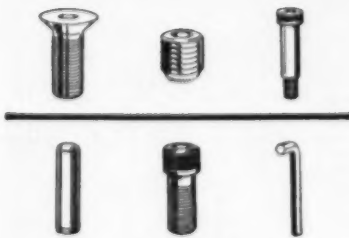
Cincinnati . . . One Ohio River sheet mill scheduled output at 116 pct of rated capacity this week. Although rating may be unrealistic, pressure for production is indicated. Major area scrap purchaser placed regular monthly order at same price last week with tonnage slightly reduced. Louisville and Nashville Railroad strike still on but embargo lifted so shipments accepted subject to delay. Under this arrangement, most operations struggling along.

Buffalo . . . A consumer entered the market this week for a tonnage of No. 2 steel and No. 2 bundles at \$1.50 per ton off previous prices. Price of No. 1 heavy melting dropped in sympathy. The mill also purchased short turnings at \$22.50, off \$1.50. Market weakness is attributed to inactivity and mill use of more hot metal from blast furnaces.

Boston . . . Domestic demand seems to be growing quieter by the week. Reflecting this lag, price on No. 2 heavy melting dropped \$1 to \$27 to \$28. Export continues to hold strong.

West Coast . . . Seattle market strong and commitments for the new month boosted prices \$2 a ton on No. 1 and No. 2 heavy melting. San Francisco Bay Area scrap moving at a lazy pace. Los Angeles demand continues brisk.

UNBRAKO AT WORK



BUTTONING UP THE JOB PROPERLY. UNBRAKO Button Head Socket Screws, of course, provide a smooth, streamlined surface. They are strong, too. But equally important is the ease with which they can be inserted and withdrawn without marring the socket of the screw or the surface of the assembly. For the complete UNBRAKO story, see your authorized industrial distributor. Or write to STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

UNBRAKO

SOCKET SCREW DIVISION

SPS

JENKINTOWN, PENNSYLVANIA

April 7, 1955

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Scrap Prices

(Effective Apr. 5, 1955)

Pittsburgh

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and ma. turn.	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs, plate	41.00 to 42.00
Heavy turnings	35.00 to 36.00
No. 1 RR. hvy. melting	40.50 to 41.50
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	51.00 to 52.00
RR. steel wheels	45.00 to 46.00
RR. spring steel	45.00 to 46.00
RR. couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	42.00 to 44.00
Cupola cast.	35.00 to 40.00
Heavy breakable cast.	34.00 to 35.00

Chicago

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	32.00 to 34.00
No. 1 factory bundles	36.00 to 38.00
No. 1 dealers' bundles	35.00 to 36.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	41.00 to 42.00
Low phos. punch'gs, plate	38.00 to 39.00
Low phos. 3 ft and under	37.00 to 38.00
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	52.00 to 53.00
Rails 2 ft and under	51.00 to 52.00
Locomotive tires, cut	37.00 to 38.00
Cut bolsters & side frames	35.00 to 36.00
Angles and splice bars	45.00 to 46.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	40.00 to 41.00
No. 1 machinery cast.	46.00 to 48.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	34.00 to 36.00
Cast iron brake shoes	35.00 to 36.00
Cast iron car wheels	38.00 to 39.00
Malleable	46.00 to 47.00
Stove plate	36.00 to 37.00

Philadelphia Area

No. 1 hvy. melting	\$36.50 to \$37.50
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles	36.50 to 37.50
No. 2 bundles	29.00 to 30.00
Machine shop turn.	21.50 to 22.50
Mixed bor. short turn.	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Clean cast chem. borings	28.00 to 29.00
Low phos. 3 ft and under	40.00 to 41.00
Low phos. 2 ft and under	41.00 to 42.00
Low phos. punch'gs	41.00 to 42.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	35.00 to 36.00
RR. steel wheels	41.50 to 42.50
RR. spring steel	41.50 to 42.50
Rails 18 in. and under	51.00 to 52.00
Cupola cast.	36.00 to 38.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	44.00 to 45.00
Malleable	44.00 to 45.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	44.00 to 45.00
Charging box cast.	37.00 to 38.00

Cleveland

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Cut struct'l & plates, 2 ft & under	42.00 to 43.00
Drop forge flashings	34.00 to 35.00
Low phos. punch'gs, plate	34.00 to 35.00
Foundry steel, 2 ft & under	40.50 to 41.50
No. 1 RR. heavy melting	36.00 to 37.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	43.00 to 44.00
Malleable	44.00 to 45.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Low phos. plate	37.00 to 38.00

Buffalo

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 busheling	31.00 to 32.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	25.50 to 26.50
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	37.00 to 38.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$28.50 to \$29.50
No. 2 hvy. melting	23.00 to 24.00
No. 1 bundles, openhearth	28.50 to 29.50
No. 2 bundles	21.00 to 22.00
New busheling	28.00 to 29.00
Drop forge flashings	27.00 to 28.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	15.50 to 16.50
Shoveling turnings	16.50 to 17.50
Cast iron borings	16.50 to 17.50
Low phos. punch'gs, plate	32.00 to 33.00
No. 1 cupola cast.	36.00 to 38.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	32.00 to 33.00
Automotive cast.	40.00 to 42.50

St. Louis

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	24.50 to 25.50
Machine shop turn.	15.50 to 16.50
Cast iron borings	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
No. 1 RR. hvy. melting	36.00 to 37.00
Rails, random lengths	40.50 to 41.50
Rails, 18 in. and under	47.50 to 48.50
Locomotive, tires uncut	36.00 to 37.00
Angles and splice bars	36.00 to 37.00
Std. steel car axles	25.50 to 26.50
RR. spring steel	37.00 to 38.00
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	33.00 to 34.00
Cast iron brake shoes	32.00 to 33.00
Stove plate	34.00 to 35.00
Cast iron car wheels	35.00 to 36.00
Malleable	35.00 to 36.00
Unstripped motor blocks	32.50 to 33.50

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 bundles	27.00 to 28.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	27.00 to 28.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and short turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	27.00 to 28.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$32.50
No. 2 hvy. melting	28.50
No. 2 bundles	\$24.00 to 25.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Clean cast chem. borings	22.00 to 23.00
Cast iron machinery cast.	37.00 to 38.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	33.00 to 34.00
Bar crops and plate	37.00 to 38.00
Structural and plate, 2 ft.	37.00 to 38.00
No. 1 RR. hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	39.00 to 40.00
Rails, 18 in. and under	44.00 to 45.00
Angles & splice bars	40.00 to 41.00
Rerolling rails	43.00 to 44.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	35.50 to 36.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos., 18 in. & under	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

San Francisco

No. 1 hvy. melting	\$27.00
No. 2 hvy. melting	25.00
No. 1 bundles	28.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn.	8.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	27.00
No. 1 cupola cast.	40.00

Los Angeles

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	18.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under	30.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	\$41.00 to 42.00

Seattle

No. 1 hvy. melting	\$33.00
No. 2 hvy. melting	29.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	\$34.00
No. 2 hvy. melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Bushings	29.00
Bush., new fact prep'd	32.00
Bush., new fact unprep'd	28.00
Short steel turnings	\$16.00 to 17.00
Mixed bor. and turn.	16.00 to 17.00
Rails, rerolling	43.00
Cast scrap	42.00 to 45.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Price Hike Hasn't Helped Copper

Boost to 36¢ level hasn't eased the copper scarcity

... But some sources see supply problem easing in June ... Chile earmarks 50 pct of output for the U. S.

◆ INCREASE in the price of copper last week did nothing to ease the painful supply pinch. Price was finally firmed at 36¢ per lb late in the week when Kennecott at last went along with other producers and upped its price 3¢ per lb. But there's still no more metal to be had at the new 36¢ level than there was at 33¢.

For the immediate future there's no indication of any lessening of the copper shortage. But there are signs consumers will find relief sometime in June.

Government action late last week to make 17,500 tons more copper available to industry during the second quarter will help soften the squeeze, though very little of this copper will actually show up in consumer's hands this month.

In its effort to aid copper consumers, the government diverted 10,400 tons from the DPA inventory and the stockpile. This amount will have to be repaid by Mar. 31, 1956.

In addition, approximately 7100 tons of copper that were diverted from the stockpile last fall and were to have been made up by the end of June have also been made available to industry. This amount will also have to be replaced by the end of March of next year.

Another factor that indicates the copper shortage will be less severe in June: the Chilean Minister of Mines has stated that 50 pct of the copper turned out by American copper companies in Chile will be sold to the U. S., with the other half going to the higher priced European market. If this happens, it would mean an increase in copper shipments to the U. S.

Again this is something that won't affect the market immediately. Copper consumers can hope for relief in the future, but the next 30-60 days will continue to be rough.

ALUMINUM . . . Industry is waiting to see what will happen as a

result of government's deferment of 75,000 tons aluminum from the stockpile, and also what effect restriction on aluminum scrap exports will have on the market. As of early this week the situation was unchanged. The squeeze is still on.

Aluminum Smelters Research Institute criticized the government's move in limiting scrap exports to 9000 tons in the second quarter; and suggested almost complete embargo of aluminum scrap exports as the only way to help smelters, foundries and diecasters. By permitting scrap exports to remain at first quarter levels the government's action in releasing 75,000 tons of primary aluminum from scheduled stockpile shipments is virtually nullified, the Institute stated.

Most smelters reported a high volume of bookings last week. There has been little change in secondary aluminum prices with the exception of a slight easing of deoxidizing grades.

COPPER . . . To help ease the copper shortage the government has released 17,500 tons of the metal to industry. In postponing the government claim for this amount of copper, Office of Defense Mobilization points out that none of the copper is being taken from the national stockpile.

Of the 17,500 tons being released, 10,400 tons were intended for the Defense Production Act Inventory and the stockpile. Commerce Dept. will handle distribution. The remaining 7100 tons is copper that was to have been repaid to the government by June 30 to counterbalance the diversion of this amount last fall. Now ODM has set Mar. 31 as the repayment date.

NICKEL . . . Supply of nickel for non-defense production this month will be reduced because of heavier defense production orders. But total supply of nickel for April, May and June will be the same as in February and March.

Deliveries of nickel to the government are being trimmed again this quarter as they were in February and March in order to release an additional one million lb per month to industry.

TITANIUM . . . Du Pont last week followed the lead of Titanium Metals Corp. by reducing the price of its sponge metal 55¢ per lb on one grade and 50¢ on another. Price of Grade A-1 ductile sponge has been cut from \$4.50 to \$3.95 per lb, while Grade A-2 sponge was dropped from a level of \$4 to \$3.50 per lb.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Mar. 30	Mar. 31	Apr. 1	Apr. 2	Apr. 4	Apr. 5
Copper, electro, Conn.	33.00-36.00	36.00	36.00	36.00	36.00	36.00
Copper, Lake, delivered	36.00	36.00	36.00	36.00	36.00	36.00
Tin, Straits, New York	91.00	91.00	90.625	...	90.75	90.75*
Zinc, East St. Louis	11.50	11.50	11.50	11.50	11.50	11.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices

*Tentative

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in March based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper,		Zinc, E. St. Louis	11.50
Del'd Conn. Valley	33.222	Zinc, New York	12.00
Lake copper, delivered	33.222	Lead, St. Louis	14.80
Straits tin, New York	91.043	Lead, New York	15.00

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet			Plate
	0.032 in.	0.081 in.	0.136 in.	0.250 in.
1100, 3003	39.1	37.1	35.9	35.5
5004	44.0	39.8	38.1	37.6
5052	46.7	41.9	40.2	39.3
2024-O, OAL	49.4	40.8	39.3	39.4
7075-O, OAL	60.8	49.1	46.8	46.8

Extruded Solid Shapes: Shape factors 1 to 8, 38.7¢ to 86.7¢; 12 to 14, 39.4¢ to \$1.04; 24 to 26, 42.2¢ to \$1.35; 36 to 38, 49.5¢ to \$1.97.
 Rod, Round: Rolled, 1.064-4.5 in. 1100-F, 45.6¢ to 46.1¢; cold finished, 0.375-3.49 in. 1100-F, 47.9¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T3, 1/4-11/32 in., 63.5¢ to 60.1¢; 3/16-1/2 in., 49.9¢ to 46.9¢; 1/2-1/2 in., 45.7¢ to 42.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 1100, 47.1¢ to 35.5¢; 5052, 56.7¢ to 44.4¢; 2017-T4, 54.3¢ to 44.7¢; 6061-T4, 59.5¢ to 44.1¢.

Extruded Tubing: Rounds, 6063-T5, OD 1/4-2 in., 44.4¢ to 64.5¢; 2-4 in., 40.3¢ to 54.6¢; 4-6 in., 40.8¢ to 49.5¢; 6-9 in., 41.4¢ to 52.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42.4¢ x 60-in., \$2.998; x 96-in., \$4.801; x 120-in., \$6.092; x 144-in., \$7.202. Coiled sheet, per lb, 0.019 in. x 28 in., 30.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: F51-O 1/4 in., 59¢; 3/16 in., 60¢; 1/2 in., 59¢; 0.064 in., 76¢; 0.032 in., 97¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 79¢; 1/2 to 1 in., 62.5¢; 1 1/4 to 1.749 in., 59¢; 2 1/4 to 5 in., 54.5¢. Other alloys higher.

Base up to 1/2 in. diam, 10,000 lb.; 1/2 to 2 in., 20,000 lb.; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M, in weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 67.3¢; 0.22 to 0.25 lb, 5.9 in., 64.3¢; 0.50 to 0.59 lb, 8.6 in., 61.7¢; 1.8 to 2.59 lb, 19.5 in., 59.8¢; 4 to 6 lb, 28 in., 55¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb.; 1/2 to 1.80 lb, 20,000 lb.; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD 1/4 to 5/16 in., 11.4¢; 5/16 to 1/2 in., 11.32¢; 1/2 to 1 in., 99¢; 1 to 2 in., 82¢; 0.165 to 0.219 in. wall: OD, 1/4 to 1 in., 67¢; 1 to 2 in., 63¢; 3 to 4 in., 62¢. Other alloys higher. Base, OD: Up to 1 1/2 in., 10,000 lb.; 1 1/2 to 3 in., 20,000 lb.; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$9; Forgings, \$9.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube, 123	108	152	
Shot, Blocks	65		

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	52.79		54.86
Copper, h-r	54.76	51.11	
Copper, drawn		52.36	
Low brass	49.75	49.69	
Yellow brass	46.27	46.21	
Red brass	50.93	50.93	
Naval brass		44.30	45.56
Leaded brass			43.09
Com. bronze	52.78	52.72	
Mang. bronze	53.73	47.83	49.39
Phos. bronze	73.03	73.53	
Muntz metal	48.14	43.95	45.20
NI silver, 10 pct 60.20		63.28	66.34
Beryllium copper, CR, 1.9% Be, Base			
2000 lb, f.o.b.			
Strip			\$1.74
Rod, bar, wire			1.71

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum Ingot, 99+%, 10,000 lb.	23.20
Freight allowed	21.50
Aluminum pig	21.50
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd Be	\$40.00
Beryllium aluminum 5% Be, Dollars	
per lb contained Be	\$72.75
Bismuth, ton lots	\$2.25
Cadmium, def'd	\$1.70
Cobalt, 97-99% (per lb)	\$3.60 to \$2.67
Copper, Lake, delivered	36.00
Copper, U. S. Treas., per troy oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$120
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	28.50
Ingot	29.25
Magnesium, sticks, 100 to 500 lb	49.00
Mercury, dollars per 76-lb flask	
f.o.b. New York	\$321 to \$324
Nickel electro, f.o.b. N. Y. warehouse	67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	\$18 to \$20
Platinum, dollars per troy oz.	\$75 to \$80
Silver, New York, cents per troy oz.	\$8.50
Tin, New York	90.75
Titanium, sponge, grade A-1	33.95
Zinc, East St. Louis	11.50
Zinc, New York	12.00
Zirconium copper, 50 pct	\$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 Ingot	
No. 115	37.00
No. 120	36.50
No. 123	36.00
80-10-10 Ingot	
No. 305	41.00
No. 315	38.75
58-10-2 Ingot	
No. 210	50.75
No. 215	47.25
No. 245	42.25
Yellow Ingot	
No. 405	32.25
Manganese bronze	
No. 421	34.75

Aluminum Ingot

(Cents per lb def'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	31.50-32.50
0.60 copper, max.	31.25-32.25
Piston alloys (No. 123 type)	30.00-31.50
No. 12 alum. (No. 2 grade)	29.25-30.25
108 alloy	30.00-31.00
195 alloy	31.00-32.50
13 alloy (0.60 copper max.)	31.25-32.25
ASX-679	30.00-31.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2%	30.50-31.50
Grade 2—92-95%	30.00-30.50
Grade 3—90-92%	29.00-29.50
Grade 4—85-90%	28.00-28.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.92
Electrodeposited	39.78
Flat rolled	45.42
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	90.50*
Cadmium	\$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulphate, 99.5 crystals, bbl.	13.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	31.25*
Nickel chloride, 300 to 400 lb.	43.50*
Silver cyanide, 100 oz. lots, per oz.	75 1/2
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	64.30

*Effective Jan. 3.

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	32	31 1/2
Yellow brass	23 1/2	22
Red brass	28 1/2	27 1/2
Comm. bronze	29 1/2	28 1/2
Mang. bronze	22 1/6	21 1/2
Yellow brass rod ends	23 1/2	

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	36
No. 2 copper wire	34 1/2
Light copper	32 1/2
*Refinery brass	31 —31 1/2

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	35 —35 1/2
No. 2 copper wire	33
Light copper	31 1/2
No. 1 composition	28 1/2 —29
No. 1 comp. turnings	28 —28 1/2
Roller brass	22 —22 1/2
Brass pipe	21 1/2
Radiators	23 —23 1/2

Mixed old cast	17 1/2 —18 1/2
Mixed new clips	18 —20
Mixed turnings, dry	17 1/2 —19
Pots and pans	18 —19

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	32 —32 1/2
No. 2 heavy copper and wire	30 —31
Light Copper	27 —28
New type shell cuttings	27 —28
Auto radiators (unsweated)	20 —20 1/2
No. 1 composition	25 1/2 —26
No. 1 composition turnings	23 1/2 —24
Unlined red car boxes	18 1/2 —19
Cocks and faucets	21 —21 1/2
Mixed heavy yellow brass	17 1/2 —18
Old rolled brass	18 1/2 —19
Brass pipe	21 —22
New soft brass clippings	22 —22 1/2
Brass rod ends	20 1/2 —21
No. 1 brass rod turnings	19 1/2 —20

Aluminum

Alum. pistons and struts	11 1/2 —12 1/2
Aluminum crankcases	15 1/2 —16
1100 (28) aluminum clippings	18 —18 1/4
Old sheet and utensils	14 —14 1/2
Borings and turnings	9 1/2 —10
Misc. cast aluminum	14 1/2 —15
2024 (24s) clippings	15 —15 1/2

Zinc

New zinc clippings	7
Old zinc	6 1/2
Zinc routings	3 1/2 —3 3/4
Old die cast scrap	3 1/4 —3 1/2

Nickel and Monel

Pure nickel clippings	57
Clean nickel turnings	40
Nickel anodes	57
Nickel rod ends	57
New Monel clippings	28
Clean Monel turnings	21
Old sheet Monel	26
Nickel silver clippings, mixed	16 1/2
Nickel silver turnings, mixed	13 1/2

Lead

Soft scrap lead	11 1/2 —11 3/4
Battery plates (dry)	6 1/2 —6 3/4
Batteries, acid free	4 1/2

Magnesium

Segregated solids	18 1/2 —19
Castings	17 1/2 —18

Miscellaneous

Block tin	70 —75
No. 1 pewter	60 —66
No. 1 auto babbitt	46
Mixed common babbitt	12 —12 1/2
Solder joints	17
Siphon tops	45
Small foundry type	16 1/2
Monotype	15
Lino. and stereotype	12 1/2 —14
Electrotype	12 1/2 —13 1/2
Hand picked type shells	9 1/2 —10
Lino. and stereo. dross	6 1/2
Electro dross	6

IRON AGE

STEEL
PRICES(Effective
Apr. 5, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$86.00 B3		4.30 B3	6.45 B3	4.30 B3						
	Buffalo, N. Y.	\$64.00 B3	\$78.00 B3, R3	\$86.00 B3, R3	5.075 B3	4.30 B3	6.45 B3	4.30 B3	4.05 B3, R3	5.75 R2, S10	6.15 B3	8.425 B3	
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.							4.10 A2	5.00 A2	6.15 A2			
	New Bedford, Mass.								6.20 R6				
	Johnstown, Pa.	\$64.00 B3	\$78.00 B3	\$86.00 B3		4.30 B3	6.45 B3	4.05 B3					
	Fairless, Pa.												
	New Haven, Conn.								6.20 D1, 6.50 A5				
	Phoenixville, Pa.				4.20 P2		4.30 P2						
	Sparrows Pt., Md.							4.05 B3	5.75 B3	6.15 B3	8.425 B3		
	Bridgeport, Wellingford, Conn.	\$69.00 N8	\$83.00 N8					4.35 N8	6.20 W1			7.00 N8	
	Pawtucket, B. I. Worcester, Mass.								6.30 N7, 6.60 A5				12.75 A5 12.00 N7
MIDDLE WEST	Alton, Ill.							4.225 L1					
	Ashland, Ky.							4.05 A7					
	Canton-Massillon, Deter, Ohio		\$86.00 R3	\$86.00 R3, T3									12.45 G4
	Chicago, Ill.	\$64.00 U1	\$78.00 R3, U1, W8	\$86.00 U1, W8, R3	5.075 U1	4.25 U1, W8	6.40 U1, Y1	4.25 U1	4.05 A1, N4 W8	5.85 A1			
	Cleveland, Ohio								5.75 A5, J3		8.00 A5		12.45 A5
	Detroit, Mich.			\$86.00 R5				4.16 G3, M2	5.85 D1, D2, G3, M2, P11	6.25 G3	8.70 D2, G3		
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana	\$64.00 U1	\$78.00 U1	\$86.00 U1, Y1	5.075 F3	4.25 J3, U1	6.40 U1, J3	4.05 J3, U1, Y1	5.85 J3	6.15 U1, J3, Y1	8.60 Y1	6.70 U1, Y1	
	Sterling, Ill.							4.15 N4					
	Indianapolis, Ind.								5.90 C5			6.70 Y5	
	Newport, Ky.												
	Middletown, Ohio								5.75 A7				
	Niles, Warren, Ohio Sharon, Pa.							4.05 S1, R3	5.75 S1, R3, T4	6.15 S1, R3	8.60 S1, R3	6.70 S1	12.45 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$64.00 U1, J3	\$78.00 J3, U1, C11	\$86.00 U1, C11	5.075 U1	4.25 J3, U1	6.40 J3, U1	4.25 U1	4.05 P6	5.75 B4, J3		6.70 S9	12.45 S9
	Portsmouth, Ohio							4.05 P7	5.75 P7				
	Weirton, Wheeling, Follansbee, W. Va.					4.25 W3		4.05 W3	5.75 F3, W3	6.15 W3	8.60 W3		
	Youngstown, Ohio		\$78.00 C10	\$86.00 Y1, C10		4.25 Y1	6.40 Y1	4.05 U1, Y1	5.75 Y1, C5	6.15 U1, Y1	8.60 Y1	6.70 U1, Y1	12.45 C5
WEST	Fontana, Cal.	\$72.00 K1	\$86.00 K1	\$105.00 K1		4.90 K1	7.05 K1	5.25 K1	4.825 K1	7.50 K1	7.25 K1	8.10 K1	14.55 K1
	Geneva, Utah		\$78.00 C7			4.25 C7	6.40 C7						
	Kansas City, Mo.					4.30 S2	6.45 S2				6.40 S2	6.95 S2	
	Los Angeles, Torrance, Cal.		\$87.50 B2	\$106.00 B2		4.95 B2, C7	7.10 B2	4.80 B2, C7	7.00 C1				
	Minneapolis, Colo.					4.70 C6		5.15 C6					
	Portland, Ore.					5.00 O2							
	San Francisco, Niles, Pittsburgh, Cal.		\$87.50 B2			4.90 B2 4.95 P9	7.05 B2	4.80 B2, C7					
	Seattle, Wash.		\$91.50 B2			5.00 B2	7.15 B2	5.05 B2, P12					
	Atlanta, Ga.							4.25 A8					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$64.00 T2	\$78.00 T2			4.25 C76, R3, T2	6.40 T2			6.15 T2			
	Houston, Tex.		\$83.00 S2	\$91.00 S2		4.30 S2	6.45 S2			6.40 S2		6.95 S2	

IRON AGE		Steel prices identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
(Effective Apr. 5, 1955)		Hot-rolled 18 ga. & heavy	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Tens 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.											† Special coated mfg. terms deduct 95¢ from 1.25-lb. cokes base box price. Can-making quality blackplate 55 to 120 lb. deduct \$2.20 from 1.25-lb. cokes base box. * COKE: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 85¢; 1.00-lb. add \$1.10. Differential 1.00 lb./0.25 lb. add 85¢.		
	Buffalo, N. Y.	4.05 B3	4.95 B3				6.10 B3	7.50 B3			4.875 W6			
	Claymont, Del.													
	Coatesville, Pa.													
	Conahocken, Pa.	4.10 A2	5.00 A2				6.15 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.875 B3			
	Fairless, Pa.	4.10 U1	5.00 U1				6.15 U1	7.55 U1				\$8.90 U1	\$7.60 U1	
	New Haven, Conn.													
MIDDLE WEST	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.05 B3	4.95 B3	5.45 B3			6.10 B3	7.50 B3	8.20 B3		4.775 B3	\$8.90 B3	\$7.60 B3	
	Worcester, Mass.										4.975 A3			
	Trenton, N. J.													
	Alton, Ill.										4.85 L1			
	Ashland, Ky.	4.05 A7		5.45 A7	5.375 A7									
	Canton-Massillon, Ohio			5.45 R1, R3						5.175 R1				
	Chicago, Joliet, Ill.	4.05 A1, W8					6.10 U1				4.875 A5, N4, R3			
	Sterling, Ill.										4.775 N4			
	Cleveland, Ohio	4.05 J3, R3	4.95 J3, R3		5.375 R3		6.10 J3, R3	7.50 J3, R3			4.875 A5			
WEST	Detroit, Mich.	4.15 G3, M2	5.05 G3				6.20 G3	7.60 G3						
	Newport, Ky.	4.05 N5	4.95 N5	5.45 N5										
	Gary, Ind. Harbor, Indiana	4.05 J3, U1, Y1	4.95 J3, U1, Y1	5.45 U1, J3	5.375 J3, U1	5.85 U1	6.10 U1, J3, Y1	7.50 U1, Y1			4.875 Y1	\$8.90 J3, U1, Y1	\$7.50 J3, U1, Y1	6.20 U1, Y1
	Granite City, Ill.	4.25 G2	5.15 G2	5.65 G2	5.575 G2								\$7.60 G2	6.30 G2
	Kokomo, Ind.	4.15 C9		5.55 C9						5.20 C9	4.775 C9			
	Mansfield, Ohio					5.85 E2				5.175 E2				
	Middletown, Ohio		4.95 A7		5.375 A7	5.85 A7								
	Niles, Ohio	4.05 S1, R3	4.95 R3	5.45 N3	6.725 N3	5.85 N3	6.10 S1, R3	7.50 R3				\$8.90 R3	\$7.50 R3	
	Sharon, Pa.	5.30 N3	5.975 N3											
	Pittsburgh, Pa.	4.05 J3, U1, P6	4.95 J3, U1, P6	5.45 U1	5.375 U1		6.10 J3, U1	7.50 J3, U1	8.20 U1		4.875 A5, 4.875 P6	\$8.90 J3, U1	\$7.50 J3, U1	6.20 U1
SOUTH	Butler, Pa.													
	Portsmouth, Ohio	4.05 P7	4.95 P7								4.875 P7			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 W3, W3	4.95 W3, W3, F3	5.45 W3, W3		5.85 W3, W3	6.10 W3	7.50 W3				\$8.90 W3, W3	\$7.50 W3, W3	6.20 F3, W3
	Youngstown, Ohio	4.05 U1, Y1	4.95 Y1		5.375 Y1		6.10 U1, Y1	7.50 Y1			4.875 Y1			
	Fontana, Cal.	4.825 K1	6.05 K1				6.875 K1	8.55 K1			5.475 K1			
	Geneva, Utah	4.15 C7												
	Kansas City, Mo.										4.925 S2			
	Los Angeles, Torrance, Cal.										5.475 C7, B2			
	Minneapolis, Colo.										4.925 C6			
	San Francisco, Niles, Pittsburg, Cal.	4.75 C7	5.90 C7	6.20 C7							5.325 C7	\$9.55 C7	\$8.25 C7	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala.	4.05 R3, T2	4.95 T2	5.45 R3, T2			6.10 T2			5.35 R3	4.875 T2, R3	\$8.90 T2	\$7.60 T2	
	Alabama City, Ala.													
SOUTH	Houston, Tex.										4.925 S2			

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES(Effective
Apr. 5, 1955)

	BARS						PLATES				WIRE
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	
EAST											
Reading, Pa.				5.075 B3	6.625 B3	6.45 B3					
Buffalo, N. Y.	4.30 B3,R3	4.30 B3,R3	5.45 B5	5.075 B3,R3	6.625 B3,B5	6.45 B3	4.225 B3,R3			6.45 B3	5.75 W6
Claymont, Del.							4.225 C4		5.80 C4		
Coatesville, Pa.							4.225 L4		5.80 L4	6.45 L4	
Conschocken, Pa.							4.225 A2	5.275 A2		6.45 A2	
Harrisburg, Pa.							4.225 C3	5.275 C3			
Hartford, Conn.			5.90 R3		6.925 R3						
Johnstown, Pa.	4.30 B3	4.30 B3		5.075 B3		6.45 B3	4.225 B3		5.80 B3	6.45 B3	5.75 B3
Fairless, Pa.	4.45 U1	4.45 U1		5.225 U1							
Newark, N. J.			5.85 W10		6.90 W10						
Camden, N. J.			5.85 P10								
Bridgeport, Putnam, Conn.	4.55 N8		5.85 W10	5.225 N8			4.475 N8				
Sparrows Pt., Md.		4.30 B3					4.225 B3		5.80 B3	6.45 B3	5.95 B3
Palmer, Worcester, Readville, Mansfield, Mass.			5.85 W11 5.95 B5,C14		6.925 A5,B5						6.85 A5, W6
MIDDLE WEST											
Alton, Ill.	4.50 L1										5.925 L1
Ashland, Newport, Ky.							4.225 A7,N5		5.80 N5		
Canton-Massillon, Mansfield, Ohio	4.40 R3		5.40 R2,R3	5.075 R3,T3	6.625 R2,R3,T3		4.225 E2				
Chicago, Joliet, Ill.	4.30 U1, N4,W8,R3	4.30 N4,R3	5.40 A5,W10, W8,B5,L2	5.075 U1,R3, W8	6.625 A5,W8, W10,L2,B5		4.225 U1,W8, I3,A1,R3	5.275 U1	5.80 U1	6.45 U1	5.75 A5, R3,N4,W7
Cleveland, Ohio	4.30 R3	4.30 R3	5.40 A5,C13		6.625 A5,C13	6.45 R3	4.225 J3,R3	5.275 J3		6.45 J3,R3	5.75 A5, C13
Detroit, Mich.	4.40 G3 4.45 R5		5.40 R3 5.40 B5,P8 5.85 P3	5.075 R5 5.175 G3	6.625 R5 6.825 B5,P3 P8	6.55 G3	4.325 G3			6.55 G3	
Duluth, Minn.											5.75 A5
Gary, Ind. Harbor, Crawfordsville	4.30 J3,U1, Y1	4.30 J3,U1, Y1	5.40 M5,R3	5.075 J3,U1, Y1	6.625 M5, R3	6.45 U1,J3, Y1	4.225 J3, U1,Y1	5.275 J3	5.80 U1,Y1	6.45 U1,J3, Y1	5.85 M4
Granite City, Ill.							4.425 G2				
Kokomo, Ind.											5.85 C9
Sterling, Ill.	4.40 N4	4.40 N4									5.85 N4
Niles, Ohio Sharon, Pa.	4.30 R3					6.45 R3	4.225 S1,R3		5.80 S1	6.45 S1	
Pittsburgh, Pa. Midland, Pa.	4.30 J3, U1, C11	4.30 J3, U1	5.40 A5,C8, C11,J3, W10,B4,R3	5.075 U1,C11	6.625 A5,C11, W10,C8,R3	6.45 J3, U1	4.225 J3, U1	5.275 U1	5.80 U1	6.45 J3, U1	5.75 A5, J3, P6
Portsmouth, Ohio											5.75 P7
Wairten, Wheeling, Fellershoe, W. Va.	4.30 W3						4.225 W3, W3				
Youngstown, Ohio	4.30 U1,Y1, C10,R3	4.30 U1,Y1, R3	5.40 F2,Y1, C10	5.075 U1,Y1, C10	6.625 Y1,C10 6.665 F2	6.45 U1,Y1	4.225 U1,Y1, R3		5.80 Y1	6.45 Y1	5.75 Y1
WEST											
Emeryville, Cal.	5.05 J5	5.05 J5									
Fontana, Cal.	5.00 K1	5.00 K1		6.125 K1		7.70 K1	4.875 K1		6.45 K1	7.15 K1	
Geneva, Utah							4.225 C7			6.45 C7	
Kansas City, Mo.	4.85 S2	4.85 S2		5.325 S2		6.70 S2					6.80 S2
Los Angeles, Torrance, Cal.	5.00 B2,C7	5.00 B2,C7	6.85 R3	6.125 B2		7.15 B2					6.70 B2
Minneapolis, Colo.	4.75 C6	4.75 C6					5.075 C6				6.80 C6
Portland, Ore.	5.85 O2	5.85 O2									
San Francisco, Niles, Pittsburg, Cal.	5.00 C7,P9 5.85 B3	5.00 C7,P9 5.85 B2				7.20 B2					6.70 C7
Seattle, Wash.	5.05 B2,P12, N6	5.05 B2,P12				7.20 B2	5.125 B2		6.70 B2	7.35 B2	
SOUTH											
Atlanta, Ga.	4.50 A8	4.50 A8									5.95 A8
Fairfield, Ala. City, Birmingham, Ala.	4.30 T2,C16, R3	4.30 T2,C16, R3				6.45 T2	4.225 T2,R3			6.45 T2	5.75 R3, T2
Houston, Ft. Worth, Lone Star, Tex.	4.55 S2	4.55 S2		5.325 S2		6.70 S2	4.95 L3 4.275 S2		5.85 S2	6.50 S2	6.00 S2

Key to Steel Producers

With Principal Offices

<i>A1</i> Acme Steel Co., Chicago	<i>G2</i> Granite City Steel Co., Granite City, Ill.	<i>P8</i> Plymouth Steel Co., Detroit
<i>A2</i> Alan Wood Steel Co., Conshohocken, Pa.	<i>G3</i> Great Lakes Steel Corp., Detroit	<i>P9</i> Pacific States Steel Co., Niles, Cal.
<i>A3</i> Allegheny Ludlum Steel Corp., Pittsburgh	<i>G4</i> Greer Steel Co., Dover, O.	<i>P10</i> Precision Drawn Steel Co., Camden, N. J.
<i>A4</i> American Cladmetals Co., Carnegie, Pa.	<i>H1</i> Hanna Furnace Corp., Detroit	<i>P11</i> Production Steel Strip Corp., Detroit
<i>A5</i> American Steel & Wire Div., Cleveland	<i>I1</i> Ingersoll Steel Div., Chicago	<i>P12</i> Pacific Steel Rolling Mills, Seattle
<i>A6</i> Angell Nail & Chaplet Co., Cleveland	<i>I3</i> Inland Steel Co., Chicago	<i>R1</i> Reeves Steel & Mfg. Co., Dover, O.
<i>A7</i> Arco Steel Corp., Middletown, O.	<i>I4</i> Interlake Iron Corp., Cleveland	<i>R2</i> Reliance Div., Eaton Mfg. Co., Massillon, O.
<i>A8</i> Atlantic Steel Co., Atlanta, Ga.	<i>J1</i> Jackson Iron & Steel Co., Jackson, O.	<i>R3</i> Republic Steel Corp., Cleveland
<i>B1</i> Babcock & Wilcox Tube Div., Beaver Falls, Pa.	<i>J2</i> Jessop Steel Corp., Washington, Pa.	<i>R4</i> Roehling Sons Co., John A., Trenton, N. J.
<i>B2</i> Bethlehem Pacific Coast Steel Corp., San Francisco	<i>J3</i> Jones & Laughlin Steel Corp., Pittsburgh	<i>R5</i> Rotary Electric Steel Co., Detroit
<i>B3</i> Bethlehem Steel Co., Bethlehem, Pa.	<i>J4</i> Joslyn Mfg. & Supply Co., Chicago	<i>R6</i> Rodney Metals, Inc., New Bedford, Mass.
<i>B4</i> Blair Strip Steel Co., New Castle, Pa.	<i>J5</i> Judson Steel Corp., Emeryville, Calif.	<i>R7</i> Rome Strip Steel Co., Rome, N. Y.
<i>B5</i> Bliss & Laughlin, Inc., Harvey, Ill.	<i>K1</i> Kaiser Steel Corp., Fontana, Cal.	<i>S1</i> Sharon Steel Corp., Sharon, Pa.
<i>C1</i> Calstrip Steel Corp., Los Angeles	<i>K2</i> Keystone Steel & Wire Co., Peoria	<i>S2</i> Sheffield Steel Corp., Kansas City
<i>C2</i> Carpenter Steel Co., Reading, Pa.	<i>K3</i> Koppers Co., Granite City, Ill.	<i>S3</i> Shenango Furnace Co., Pittsburgh
<i>C3</i> Central Iron & Steel Co., Harrisburg, Pa.	<i>L1</i> Laclede Steel Co., St. Louis	<i>S4</i> Simonds Saw & Steel Co., Fitchburg, Mass.
<i>C4</i> Claymont Products Dept., Claymont, Del.	<i>L2</i> La Salle Steel Co., Chicago	<i>S5</i> Sweet's Steel Co., Williamsport, Pa.
<i>C5</i> Cold Metal Products Co., Youngstown, O.	<i>L3</i> Lone Star Steel Co., Dallas	<i>S6</i> Standard Forging Corp., Chicago
<i>C6</i> Colorado Fuel & Iron Corp., Denver	<i>L4</i> Lukens Steel Co., Coatesville, Pa.	<i>S8</i> Superior Drawn Steel Co., Monaca, Pa.
<i>C7</i> Columbia Geneva Steel Div., San Francisco	<i>M1</i> Mahoning Valley Steel Co., Niles, O.	<i>S9</i> Superior Steel Corp., Carnegie, Pa.
<i>C8</i> Columbia Steel & Shifting Co., Pittsburgh	<i>M2</i> McLouth Steel Corp., Detroit	<i>S10</i> Seneca Steel Service, Buffalo
<i>C9</i> Continental Steel Corp., Kokomo, Ind.	<i>M3</i> Mercer Tube & Mfg. Co., Sharon, Pa.	<i>T1</i> Tonawanda Iron Div., N. Tonawanda, N. Y.
<i>C10</i> Copperweld Steel Co., Pittsburgh, Pa.	<i>M4</i> Mid-States Steel & Wire Co., Crawfordsville, Ind.	<i>T2</i> Tennessee Coal & Iron Div., Fairfield
<i>C11</i> Crucible Steel Co. of America, New York	<i>M5</i> Monarch Steel Div., Hammond, Ind.	<i>T3</i> Tennessee Products & Chem. Corp., Nashville
<i>C12</i> Cumberland Steel Co., Cumberland, Md.	<i>M6</i> Mystic Iron Works, Everett, Mass.	<i>T4</i> Thomas Strip Div., Warren, O.
<i>C13</i> Cuyahoga Steel & Wire Co., Cleveland	<i>N1</i> National Supply Co., Pittsburgh	<i>T5</i> Tinsken Steel & Tube Div., Canton, O.
<i>C14</i> Compressed Steel Shifting Co., Readville, Mass.	<i>N2</i> National Tube Div., Pittsburgh	<i>T6</i> Tremont Nail Co., Warham, Mass.
<i>C15</i> G. O. Carlson, Inc., Thorndale, Pa.	<i>N3</i> Niles Rolling Mill Div., Niles, O.	<i>T7</i> Texas Steel Co., Fort Worth
<i>C16</i> Connors Steel Div., Birmingham	<i>N4</i> Northwestern Steel & Wire Co., Sterling, Ill.	<i>U1</i> United States Steel Corp., Pittsburgh
<i>D1</i> Detroit Steel Corp., Detroit	<i>N5</i> Newport Steel Corp., Newport, Ky.	<i>U2</i> Universal-Cyclops Steel Corp., Bridgeville, Pa.
<i>D2</i> Detroit Tube & Steel Div., Detroit	<i>N6</i> Northwest Steel Rolling Mills, Seattle	<i>U3</i> Ulrich Stainless Steels, Wallingford, Conn.
<i>D3</i> Driver Harris Co., Harrison, N. J.	<i>N7</i> Newman Crosby Steel Co., Pawtucket, R. I.	<i>U4</i> U. S. Pipe & Foundry Co., Birmingham
<i>D4</i> Dickson Weatherproof Nail Co., Evanston, Ill.	<i>N8</i> Northeastern Steel Corp., Bridgeport, Conn.	<i>W1</i> Wallingford Steel Co., Wallingford, Conn.
<i>D5</i> Henry Danton & Sons, Inc., Philadelphia	<i>O1</i> Oliver Iron & Steel Co., Pittsburgh	<i>W2</i> Washington Steel Corp., Washington, Pa.
<i>E1</i> Eastern Stainless Steel Corp., Baltimore	<i>O2</i> Oregon Steel Mills, Portland	<i>W3</i> Weirton Steel Co., Weirton, W. Va.
<i>E2</i> Empire Steel Co., Mansfield, O.	<i>P1</i> Page Steel & Wire Div., Monessen, Pa.	<i>W4</i> Wheatland Tube Co., Wheatland, Pa.
<i>F1</i> Firth Sterling, Inc., McKeesport, Pa.	<i>P2</i> Phoenix Iron & Steel Co., Phoenixville, Pa.	<i>W5</i> Wheeling Steel Corp., Wheeling, W. Va.
<i>F2</i> Fitzsimmons Steel Corp., Youngstown	<i>P3</i> Pilgrim Drawn Steel Div., Plymouth, Mich.	<i>W6</i> Wickwire Spencer Steel Div., Buffalo
<i>F3</i> Follansbee Steel Corp., Follansbee, W. Va.	<i>P4</i> Pittsburgh Coke & Chemical Co., Pittsburgh	<i>W7</i> Wilcox Steel & Wire Co., Chicago
<i>G1</i> Globe Iron Co., Jackson, O.	<i>P5</i> Pittsburgh Screw & Bolt Co., Pittsburgh	<i>W8</i> Wisconsin Steel Co., S. Chicago, Ill.
	<i>P6</i> Pittsburgh Steel Co., Pittsburgh	<i>W9</i> Woodward Iron Co., Woodward, Ala.
	<i>P7</i> Portsmouth Div., Detroit Steel Corp., Detroit	<i>W10</i> Wycod Steel Co., Pittsburgh
		<i>W11</i> Worcester Pressed Steel Co., Worcester, Mass.
		<i>Y1</i> Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2 In.		3 In.		3 1/2 In.		4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. B3	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0						
Youngstown R3	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0						
Fontana K1	10.75	+4.5	13.75	+0.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0						
Pittsburgh J3	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25
Alton III L1	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0						
Sharon M3	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0						
Fairless N2	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0						
Pittsburgh N1	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25
Wheeling W5	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0						
Wheatland W4	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0						
Youngstown Y1	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25
Indiana Harbor Y1	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0	13.5	+1.50	17.5	0.75	20.0	3.25
Lorain N2	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0						
EXTRA STRONG																				
PLAIN ENDS																				
Sparrows Pt. B3	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0						
Youngstown R3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0						
Fairless N2	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0						
Fontana K1	14.25		18.25		20.25		20.75		21.25		21.75		22.25							
Pittsburgh J3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75
Alton III L1	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0						
Sharon M3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0						
Pittsburgh N1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75
Wheeling W5	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0						
Wheatland W4	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0						
Youngstown Y1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75
Indiana Harbor Y1	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0						
Lorain N2	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0		19.0	3.25	21.5	5.75

Threads only, butt weld and seamless 2 1/4 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 4 1/2 pt. higher discount. Butt weld jobbers discount, 5 pt. Galvanized discounts based on zinc price range of over 9¢ to 11¢ incl. per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2, 1 3/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

Steel Prices

(Effective Apr. 5, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F. & B. Mill Cents Per Lb.	Net Sd. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Balls Treated
Beasomer U3	4.45	5.30	5.425				
So. Chicago K1				7.30			
Enley T2	4.45	5.35					
Fairfield T2		5.35		7.30		5.275	
Gary U1	4.45	5.35				5.275	
Ind. Harbor J3	4.45	5.35	5.425	7.30			
Johnstown B3		5.35					
Juliet U1		5.35	5.425				
Kansas City S2				7.30			11.90
Lackawanna B3	4.45	5.35	5.425			5.275	
Minneapolis C6	4.45	5.85	5.425	7.30		5.275	11.90
Pittsburgh O1					11.00		11.50
Pittsburgh P5						11.00	11.90
Pittsburgh J3							
Seattle B2				7.30		5.425	12.00
Stedion B3	4.45	5.425				5.275	
Struthers Y1			7.30				
Terrence C7					5.425		
Williamsport S5	5.30						
Youngstown R3				7.30			

ELECTRICAL SHEETS

22-Gage F. & B. Mill Cents Per Lb.	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi- Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 75	11.95	12.20	12.70
Trans. 65	12.50		
Trans. 55	13.00	Grain Oriented	
Trans. 52	14.00	Trans. 80	16.60
		Trans. 73	17.10

Producing plants: Beach Bottom (W5); Brackenridge (A5); Granite City (C2); Indiana Harbor (J3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).

CLAD STEEL

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa., L4		*33.60
Washington, Pa., J2		
Claymont, Del., C4		
New Castle, Ind., I2		29.75
Nickel-carbon		
10 pct. Coatesville, Pa., L4	39.50	
Inconel-carbon		
10 pct., Coatesville, Pa., L4	47.90	
Monel-carbon		
10 pct. Coatesville, Pa., L4	40.80	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F. & B. Mill	Standard & Control Nails		Woven Wire		Fence Posts		Single Loop Bldg Ties		Galv. Barbed and Twisted Barbed Wire		Merch. Wire Ann'd		Merch. Wire* Galv.	
	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal	Col	Cal
Alabama City R3	137	146			155		159		6.90		7.30			
Aliquippa, Pa. J3	137	149					156		6.90		7.45			
Atlanta A8	139	151			157		164		7.00		7.525			
Bartonsville K2	139	151			157		164		7.00		7.55			
Buffalo W6									6.90		7.30			
Chicago, Ill. M4	137	149			155		162		6.90		7.45			
Cleveland A6	142													
Cleveland A5														
Crawfordsville M4	139	151			157		159		7.00		7.55			
Donora, Pa. A5	137	149			155		162		6.90		7.45			
Duluth A5	137	149	155		162		6.90		7.45					
Fairfield, Ala. T2	137	149			155		162		6.90		7.45			
Galveston D4	139													
Houston S2	142	154					164		7.15		7.30			
Johnstown, Pa. B3	137	149					162		6.90		7.45			
Juliet, Ill. A5	137	149			155		162		6.90		7.45			
Kokomo, Ind. C9	139	148			157		161		7.00		7.55			
Los Angeles B2									7.85					
Kansas City S2	142	158			167		164		7.15		7.90			
Minneapolis C6	142	151	155		160		164		7.15		7.55			
Monessen P5	137	151					163		6.90		7.45			
Morton, Ill. R3		155												
Pittsburgh, Cal. C7	154	172			179		182		7.05		8.40			
Portsmouth P7									6.90		7.90			
Rankin, Pa. A5	137	149					162		6.90		7.45			
So. Chicago R3	137	146	155		159		6.90		7.30					
S. San Francisco C6							179							
Sparrows Pt. B3	139				157		164		7.00		7.55			
Struthers, O. Y1									6.90		7.55			
Warren, Pa. A5	143								7.20					
Williamsport, Pa. S5		150												

Cut Nails, carloads, base \$3.30 per keg at Conahatchee, Pa. (A2). Galvanized products computed with zinc at 11.0¢ per lb.

C-R SPRING STEEL

Cents Per Lb F. & B. Mill	CARBON CONTENT				
	0.25-0.41	0.41-0.61	0.61-0.81	0.81-1.00	1.00-1.35
Bridgeport, New Britain, Conn. N8	5.75	6.05	9.00	11.15	13.85
Buffalo, N. Y. R7	5.75	6.05	9.00	10.95	13.25
Carnegie, Pa. S9	5.75	6.05	9.00	11.15	13.85
Cleveland A5	5.75	6.05	9.00	11.15	13.85
Detroit D1	5.85	6.25	9.20	10.95	
Detroit D2	5.85	6.25	9.20		
Harrison, N. J. C11			9.30	11.45	14.15
Indianapolis C5	6.00	6.20	9.00	11.15	13.85
New Castle, Pa. B6	5.75	6.05	9.00	10.95	
New Haven, Conn. D1	6.20	6.35	9.30	11.25	
Pawtucket, R. I. N7	6.30	6.35	9.30	11.45	14.15
Riverdale, Ill. A1	5.85	6.05	9.00	11.15	13.85
Sharon, Pa. S1	5.75	6.05	9.00	11.15	13.85
Tronton R4		6.35	9.30	11.25	13.80
Wallingford W1	6.20	6.35	9.30	11.45	14.15
Warren, Ohio T4	5.75	6.05	9.00	11.15	13.85
Watson, W. Va. W3	5.85	6.05	9.00	10.95	13.25
Worcester, Mass. A5	6.00	6.35	9.30	11.45	14.15
Youngstown C5	5.85	6.05	9.00	11.15	13.85

BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F. & B. Mill	Size		Seamless		Elec. Weld	
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	28.33	33.97	27.48	32.95
	2 1/2	12	38.15	45.74	37.00	44.38
	3	12	44.65	52.82	42.72	51.23
	3 1/2	11	51.43	61.66	49.88	59.81
	4	10	68.29	81.08	66.24	79.42
National Tube	2	13	28.33	33.97	27.48	
	2 1/2	12	38.15	45.74	37.00	
	3	12	44.65	52.82	42.72	
	3 1/2	11	51.43	61.66	49.88	
	4	10	68.29	81.08	66.24	
Pittsburgh Steel	2	13	28.33	33.97		
	2 1/2	12	38.15	45.74		
	3	12	44.65	52.82		
	3 1/2	11	51.43	61.66		
	4	10	68.29	81.08		

WARE-HOUSES

City	City Delivery Charge	Sheets			Strip		Plates		Shapes		Bars		Alloy Bars	
		Hot-Rolled	Cold-Rolled (15 gage)	Galvalume (15 gage)	Hot-Rolled	Cold-Rolled (10 gage)	Standard Structural	Hot-Rolled	Cold- Finished	As rolled A 4615 As rolled A 4140	Hot-Rolled A 4140 Annealed A 4615	Cold-Drawn A 4615 As rolled A 4140	Cold-Drawn A 4140	
Baltimore	\$.20	6.02	7.51	7.64- 7.78	6.69	.....	6.37	6.72	6.68	8.02- 8.52	12.94	12.54	15.34	15.34
Birmingham	.15	6.35	7.35	8.25	6.60	8.85	6.65	6.65	6.50	8.85				
Boston	.10	7.23	8.23	9.52	7.47	9.65	7.34	7.20	7.20	8.40	12.85	12.60	15.40	15.34
Buffalo	.25	6.35	7.40	8.75	6.70	7.02	6.65	6.70	6.50	7.40	12.70	12.10	15.10	14.80
Chicago	.20	6.38	7.38	8.30	6.62	.....	6.52	6.69	6.51	7.25	12.25	12.05	14.60	14.70
Cincinnati	.20	6.49	7.37	8.25	6.96	.....	6.81	6.91	6.75	7.55	12.55	12.35	14.90	15.00
Cleveland	.20	6.53	7.42	8.30	6.91	.....	6.88	6.80	6.80					
Cleveland	.20	6.38	7.38	8.25	6.72	.....	6.89	7.02	6.57	7.35	11.96	12.11	14.70	14.70
Denver	.....	8.15	9.80	10.72	8.40	.....	8.10	8.15	8.30	9.92				17.12
Detroit	.20	6.57	7.57	8.58	6.90	.....	6.80	7.16	6.79	7.54	12.65	12.25	15.05	14.90
Houston	.20	7.35	7.80	9.93	7.70	.....	7.35	7.60	7.70	9.40- 9.50		13.25		14.90
Kansas City	.20	7.05	8.05	8.97	7.29	.....	7.19- 7.39	7.36	7.18	8.02		12.72		
Los Angeles	.10	7.50	9.35	9.95	7.85	.....	7.45	7.65	7.45	10.15 ^a		13.45		16.60
Memphis	.10	6.79	7.60	.....	6.90	.....	7.01	7.09	6.88	8.24				
Milwaukee	.20	6.47	7.47	8.21- 8.39	6.71	.....	6.61	6.86	6.60	7.44	12.34	12.14	14.69	14.70
New Orleans	.15	6.70	7.65	9.23	6.80	.....	6.96- 6.95	7.05	6.80	8.70- 10.70				
New York	.10	6.97	7.78	8.70 ^a	7.30	10.15	7.07	7.13	7.30	8.63	12.63	12.43		15.00
Norfolk	.20	7.07	8.56	9.09	7.56	.....	7.27	7.38	7.37	8.63 ^a				
Norfolk	.20	7.00	.....	.....	7.10	.....	7.10	7.10	7.10	8.60				
Philadelphia	.10	6.19- 8.29	8.00	8.36 ^a	7.06	.....	6.58	6.64	6.94	7.86	12.66	12.66	15.06	14.90
Pittsburgh	.20	6.38	7.38	8.30- 8.50	6.72- 6.75	.....	6.52	6.69	6.51	7.35- 7.65	12.25	12.05	14.60	14.70
Pittsburgh	.20	7.00	7.75	8.90- 9.05	7.25	.....	6.85	7.00	7.05	10.20- 11.70				
Salt Lake City	.20	7.65	10.20	10.70	9.05	.....	7.70	7.70- 8.85	8.80	10.95				
San Francisco	.20	7.55	8.95	9.35- 9.65	7.80	.....	7.40	7.50	7.35	10.05 ^a		13.35		16.30
Seattle	.00	8.10	9.80	10.15	8.20	.....	7.60	7.75	7.80	9.95		13.80		16.40
St. Louis	.20	6.62	7.67	8.54- 8.69	6.91	8.13	6.81	7.09	6.80	7.64	12.54	12.34	14.84- 14.89	14.90
St. Paul	.20	7.04	8.03- 8.50	8.94	7.28	.....	7.10	7.35	7.17	8.01		12.56		15.10

Miscellaneous Prices

(Effective Apr. 5, 1955)

TOOL STEEL

F.o.b. mill					
W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.54
18	4	1	—	5	2.245
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.29

High-carbon chromium73
Oil hardened manganese405
Special carbon37
Extra carbon31
Regular carbon26
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

Per Net Ton	
6 to 24-in., del'd Chicago	\$111.80 to \$115.30
6 to 24 in., del'd N. Y.	115.00 to 116.00
6 to 24-in., Birmingham	98.00 to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$129.50 to \$131.50
Class "A" and gas pipe, 45 extra; 4-in. pipe is \$5 a ton above 6-in.	

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	\$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.35
Menab, bessemer	10.25
Menab, nonbessemer	10.10
High phosphorus	10.00

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$14.25 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.50 to \$17.00
Foundry, oven coke	
Buffalo, del'd	\$28.05
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.00
Swedeland, Pa., f.o.b.	23.00
Painesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.45
Cincinnati, del'd	26.55
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	94	22.00	45	110	19.80
20	72	21.25	40	100, 110	9.50
16 to 18	72	21.60	35	110	9.50
14	72	22.00	30	110	9.50
12	72	22.25	24	72 to 94	9.55
8 to 10	60	22.75	20	90	8.65
7	60	23.00	17	72	8.85
6	60	25.50	14	72	10.25
4	40	28.50	10, 12	60	11.10
3	40	30.00	8	80	11.40
2 1/2	30	30.75			
2	24	47.75			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount
	Less Case C.
1/2 in. & smaller x 4 in. & shorter	2 22
1/2 in. & smaller x 6 in. & shorter	+3 18
9/16 in. & 5/8 in. x 6 in. & shorter	+4 17
3/4 in. & larger x 6 in. & shorter	+6 15
All diam. longer than 6 in. & 1/2 in. & smaller x 6 in. & shorter	+15 8
Lag, all diam. x 6 in. & shorter	+3 18
Lag, all diam. longer than 6 in.	6 25
Plow bolts	+2 19
	23 22

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
3/4" or smaller	55	64
7/8" to 1 1/4" inclusive	58	66
1 1/2" to 1 3/4" inclusive	60	67 1/2

C.P. Hex. regular & hvy.

All sizes	55	64
-----------	----	----

Hot Galv. Nuts (all types)

3/4" or smaller	58	50
7/8" to 1 1/4" inclusive	41	52 1/2

Finished, Semi-finished, Slotted or Castellated Nuts

All sizes	55	66
-----------	----	----

Rivets

	Base per 100 lb
1/2 in. & larger	\$9.25
7/16 in. and smaller	Pot Off List 27

Cap Screws

	Discount
	H.C. Heat Bright Treated
New std. hex head, packaged	
1/2" x 6" and smaller and shorter	38 28
5/8" x 1" x 6" and shorter	15 1
New std. hex head, bulk*	
5/8" x 6" and smaller and shorter	50 43
5/16-in. 1" x 6" and shorter	22 21
*Minimum quantity per item:	
15,000 pieces 1/4", 5/16", 3/8" diam.	
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.	
2,000 pieces 3/4", 7/8", 1" diam.	

Machine Screws & Stove Bolts

	Discount
	Mach. Stove Screws Bolts
Packaged, package list	33 43
Bulk, bulk list	
Quantity	
1/4-in. diam.	15,000-99,999 17 59
1/2-in. diam. & under	100,000-199,999 25 63
5/16-in. diam. & larger	200,000 & over 33 67
5,000-99,999	17 59
100,000 & over	25 63
All diam.	5,000-49,999 33 67
over 3 in.	50,000-99,999 59 63
long	100,000 & over 67 67

Machine Screw & Stove Bolt Nuts

	Discount
	Hex Square
Packaged, package list	30 33
Bulk, bulk list	
Quantity	
1/4-in. diam. & smaller	15,000-99,999 15 17
	100,000-199,999 23 25
	200,000 & over 31 33

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	\$114.00
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$120.00
Childs, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	
California	
Super Duty	
Hays, Pa., Athens, Tex., Windham	137.00
Curtner, Calif.	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	20.00
Silica cement, net ton, bulk, Hays, Pa.	23.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	

Chrome Brick

	Per net ton
Standard chemically bonded, Balt.	\$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	\$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite

	St. %-in. grains
Domestic, f.o.b. Baltimore	
In bulk fines removed	\$64.40
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	
In bulk	38.00
In sacks	43.75

Dead Burned Dolomite

	Per net ton
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	\$14.50
Midwest	15.10
Missouri Valley	13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill.	
Price, net ton; effective CaF ₂ content.	
72 1/2% or more	\$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.	
New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East	12.0¢
F.o.b. ship pt., carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, 99.5+% Fe	38.0¢
Electrolytic iron, unannealed, minus 225 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 90.8+% Fe	83.0¢ to \$1.48
Aluminum	31.5¢
Brass, 10 ton lots	20.50¢ to 36.50¢
Copper, electrolytic	49.50¢
Copper, reduced	49.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	33.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	32.75
Nickel, unannealed	39.50¢
Nickel, annealed	60.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	45.50¢
Solder powder, 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	91.0¢
Stainless steel, 316	81.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	54.05
Zinc, 10 ton lots	17.5¢ to 25.0¢

Ferroalloy Prices

(Effective Apr. 5, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max. Si.			
0.025% C ..	36.00	0.15% C ..	33.75
0.025% C ..		0.20% C ..	33.50
Simplex ..	34.50	0.50% C ..	33.25
0.06% C ..	34.50	1.00% C ..	33.00
0.10% C ..	34.00	2.00% C ..	32.75
65-69% Cr, 4-9% C ..			24.75
62-66% Cr, 4-6% C, 6.9% Si ..			25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.	
High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads ..	25.85
Ton lots ..	25.00
Less ton lots ..	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10% max. C ..	\$1.12
0.50% max. C ..	1.16
9 to 11% C ..	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)	
Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.	

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.	
50-55% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads ..	19.00
Ton lots ..	22.10
Less ton lots ..	23.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads ..	20.00
Ton lots ..	22.30
Less ton lots ..	23.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.	
Ton lots ..	17.50
Less ton lots ..	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%,	
Carload packed ..	16.50
Ton lots ..	18.10
Less ton lots ..	19.35

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%,	
Carload packed ..	17.50
Ton lots ..	18.50
Less ton lots ..	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.	
Producing Point	
Marquette, Ashland, O.; alloy, W. Va.; Sheffield, Ala.; Portland, Ore. ..	9.50
Chattanooga, Pa. ..	9.50
Sheridan, Pa. ..	9.50
Philo, Ohio ..	9.50
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk ..	11.85
Ton lots packed ..	13.65

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.	
Manganese ..	84.00
16 to 19% ..	3% max. .. 86.00
19 to 21% ..	3% max. .. 88.00
21 to 23% ..	3% max. .. 90.00
23 to 25% ..	3% max. .. 91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed ..	45.00
Ton lots ..	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads ..	30.00
Ton lots ..	32.00
250 to 1999 lb ..	34.00
Premium for hydrogen-removed metal ..	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..	
	21.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.06% ..	32.00 33.85 35.05
P, 90% Mn ..	29.95 31.80 33.80
0.07% max. C ..	29.95 30.30 31.50
0.15% max. C ..	26.95 28.80 30.90
0.30% max. C ..	26.45 28.30 29.50
0.50% max. C ..	
0.75% max. C, 80-85% ..	23.45 25.30 26.50
Mn, 5.0-7.0% Si ..	

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.	
Carload bulk ..	11.00
Ton lots ..	12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet ..	12.45
Ton lots, packed ..	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$85.00 gross ton, freight allowed to normal trade area.	
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$88.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.	

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.	
96% Si, 2% Fe ..	20.10 18.90
97% Si, 1% Fe ..	20.60 18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.	
Carloads, bulk ..	6.55
Ton lots ..	8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.	
25% Si ..	30.00 75% Si .. 14.40
50% Si ..	12.00 85% Si .. 16.10
65% Si ..	13.50 90% Si .. 17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots ..	\$2.95 \$2.95 \$2.75
Less ton lots ..	2.40 3.20 4.55

Ferrovandium

25-55% contract, basis, delivered, per pound, contained V.	
Openhearth ..	\$3.00-\$3.10
Crucible ..	3.10-3.20
High speed steel (Primus) ..	3.20-3.25

Alaifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.	
Carloads ..	9.25¢
Ton lots ..	10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ..

	\$1.25
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Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots ..	\$12.00
Less ton lots ..	12.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta ..

	\$6.25
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Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo ..

	\$1.46
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Ferrophosphorus, electric, 22-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton ..

	\$90.00
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10 tons to less carload ..

	\$110.00
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Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ..

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ..

	\$1.50
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Less ton lots ..

	\$1.55
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Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ..

	\$177.00
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Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. ..

	\$3.80
--	--------

Molybdenum oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. ..

	\$1.27
--	--------

bags, f.o.b. Washington, Pa., Langeloth, Pa. ..

	\$1.24
--	--------

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk, lump ..	15.50¢
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Ton lots, packed lump ..

	16.75¢
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Less ton lots, lump, packed ..

	17.25¢
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Vanadium Pentoxide, 86 - 89% V₂O₅, contract basis, per pound contained V₂O₅ ..

	\$128
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Zirconium, contract basis, per lb of alloy.

25-40%, f.o.b. freight allowed, ton lots ..	26.00¢
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12-15%, del'd, lump, bulk-carloads ..

	8.00¢
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Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si, 40-45%, per lb contained 2....

	\$5.25
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Bortam, f.o.b. Niagara Falls

Ton lots, per pound ..	45¢
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Less ton lots, per pound ..

	50¢
--	-----

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..	10.00¢
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Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots ..

	\$1.20
--	--------

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B ..	.85
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14 to 19% B ..

	1.20
--	------

19% min. B ..

	1.50
--	------

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 ..	\$1.00
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No. 6 ..

	\$3.25
--	--------

No. 79 ..

	50¢
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Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 2.00% max. C, 2 in. x D, del'd.

Ton lots ..	\$1.46
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Less ton lots ..

	1.57
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Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots ..

	\$2.05
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Silica, contract basis, delivered.

Ton lots ..	45.00¢
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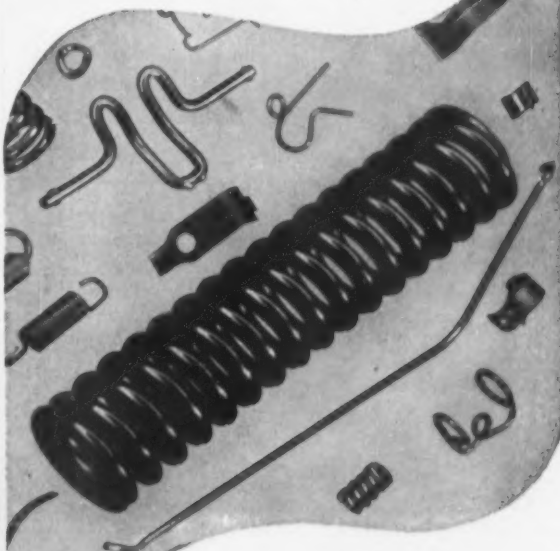
A detailed cross-sectional view of a mechanical assembly, likely a turbine or compressor component. The image shows a complex, symmetrical structure with a central shaft and multiple blades or vanes arranged radially. The assembly is mounted on a base with visible bolts. The drawing is a technical illustration, showing the internal components and the overall shape of the part.

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST

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CASE STUDY

DESIGNATION: Female Hinge

METAL USED: Stainless Steel (AISI 302)

QUALITY CONTROL: Chemical and physical affidavits furnished. Test Bars submitted. Produced with 100% X-Ray requirements.

PARTS: Designed and cast as single unit. Formerly composed of three units welded together.

ADVANTAGES: Strengthened with re-inforcing ribs in U-Bracket. Weight decreased without decrease in strength. Reaming holes only machining required. Formerly holes countersunk outer sides only, now cast with radii on both inner and outer sides. Greatly reduced cost.

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Thompson Wire Company anneals cold rolled strip with *GAS*

These are Gas-fired annealing facilities at Thompson Wire Company, Baltimore, Maryland. Here, modern industrial Gas equipment anneals cold rolled strip and assures proper quality for a variety of applications.

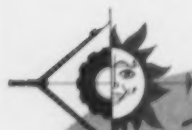
Coils of strip are placed one on top of the other on a stationary base. Then, a portable Gas-fired bell furnace is lowered over the stacked coils. Twelve Eclipse Gas burners heat the coils to the proper annealing temperature in a prepared inert gas atmosphere released from inner cones. After firing, the furnace is lifted from the base and replaced with a cooling hood

which helps slow down and equalize the cooling rate. Finally, the hood is removed and the coils of strip are lifted from the base.

With Gas, Thompson Wire Company can anneal up to 50,000 pounds of strip in 36 hours. Thompson Wire also uses Gas for water heating.

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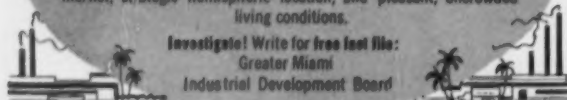


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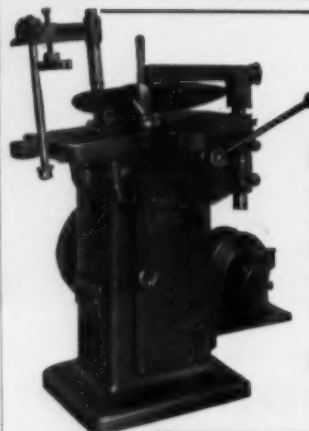
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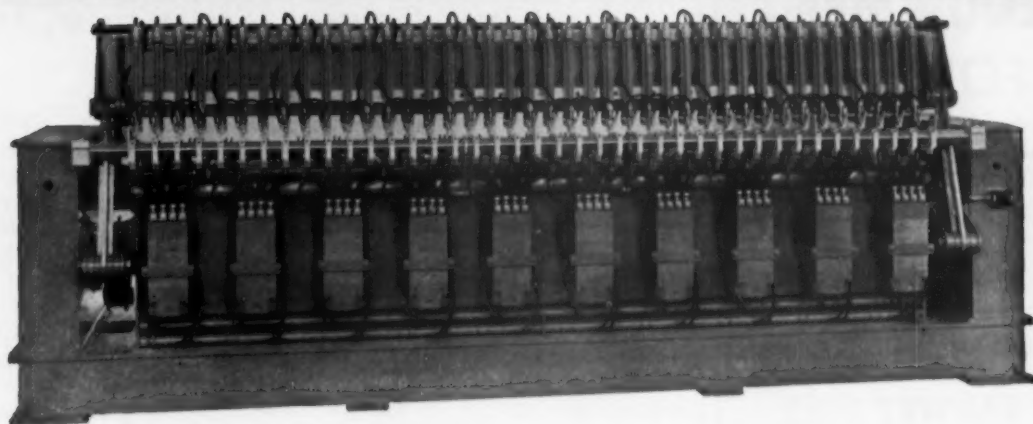
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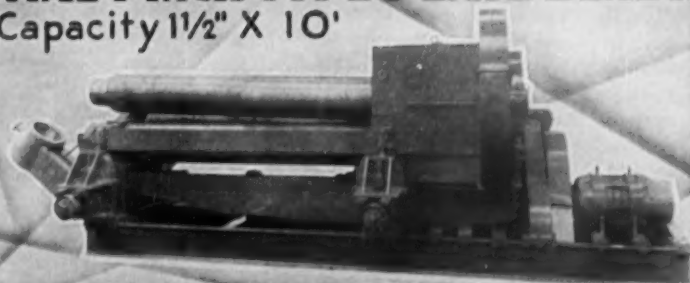
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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Cleveland Lags . . . While do-it-yourself has made amateur home mechanics of a good many adults, the do-it-yourself program in big plants is making the used machinery business drag its feet.

Several leading firms in the Cleveland area contacted last week said the business generally has not shown any upsurge comparable to the steel and metalworking industries generally. While larger firms in these fields are keeping production rates high, much of it is work normally farmed out to small subcontractors.

Small Shops Suffer . . . Thus the small machine shop, major customer of the used machinery salesman, is at the end of a hotly competitive line and in poor financial position to expand or better his cost and price structure through newer machinery. The lone exceptions are mold shops, because of the foundry work upsurge, and tool and die makers, principally for automotive firms and suppliers.

"We're not even getting a nibble on the ads we run now," Frank Thomas, manager of Acme Tool and Machinery Co. in Cleveland, said last week. "The little fellows, our major customers, just aren't getting the business now so they aren't about to invest in any newer machinery at the moment."

Lathes Gather Dust . . . Several special Potter & Johnson semi-automatic turret lathes, for example, have been in stock at Acme for months, Mr. Thomas said. Ordinarily they would be sold in a matter of weeks after acquisition. One of these, a 1940 ball-bearing equipped Model 4-D will hold tolerances of 0.0005 in.

Although a machine like this should be in good demand for high production work on castings, forgings, automatic gears, etc., there has been little interest shown in this type machine. Selling price of \$2000 compares with \$13,500 for a comparable new model.

Acme has two of these in stock and a \$1500 Model 6-A, all of which normally would not stay out of use long. Mr. Thomas estimated that there are scores in use in the city but probably less than a half dozen used models available in the area.

New York Gains . . . New York reports brisk activity with the pickup dating from about the middle of December. Current estimates rate first quarter business at 25-50 per cent better than last year.

Builders attributed gains to several factors. For one thing there appears to be a better spread on government work, with small shops getting a larger share of contracts. Fast delivery and price savings make used equipment particularly attractive to the smaller plants in the retooling that new contracts require.

Buy In East . . . Detroit upsurge is also being felt in this area. Dealers as well as users are coming East to pick up needed machines. And auction sales are bringing good prices on late machines.

Among the fabricating lines, old equipment is going well. In machine tools, big demand is for late models. Turret and automatic lathes are doing particularly well. Radial drills continue to move at a good clip.

Machinery Dealers National Assn. has announced plans for an exhibit at the Machine Tool Show to be held in Chicago Sept. 6 to 17. This will be the first time used machine tools have been represented in the show. Sponsors feel the Chicago function, which is expected to draw over 100,000 people from all over the world, provides an excellent chance to demonstrate the advantages of used and rebuilt equipment.

Question of standards for machine tool rebuilding program of Army Ordnance seems to go back to the absence of universal standards for new construction.

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BENDING ROLLS

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12" x 12" Niles-Romont-Pond Pyramid Type
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12" x 1/2" Drais & Krump, Motor Driven

BRAKES—PRESS TYPE

17" All Steel Press Brake, 250 ton Capacity
Cincinnati All Steel Press Brake 19 1/2"

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5 ton P&H Trav-Lift	30' Span 220/440 A.C.
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5 ton Toledo	60' Span 230 Volt D.C.
7 1/2 ton Shepard-Niles	22' Span 220/3/60 A.C.
10 ton Shepard-Niles	48' Span 230 Volt D.C.
10 ton Harnischfeger	50' Span 220/3/60 A.C.
13 ton OET	45' Span 220/3/60 A.C.
15 ton Case	80' Span 230 Volt D.C.
15 ton P&H	97' Span 115 Volt D.C.
25 ton P&H	With 220/440 AC Generator Set
25 ton P&H	60' Span 230 Volt D.C.
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With 2 Trays 62 1/2 ton & 10 ton Aux.

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25 ton Henry & Wright, 1 1/2" Stroke, Double Roll Feed, Recip Shear

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100,000# Poole Draw Bench, Max. length of bar 30'
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Between Columns

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48" x 1 1/2" Mackintosh-Humphill

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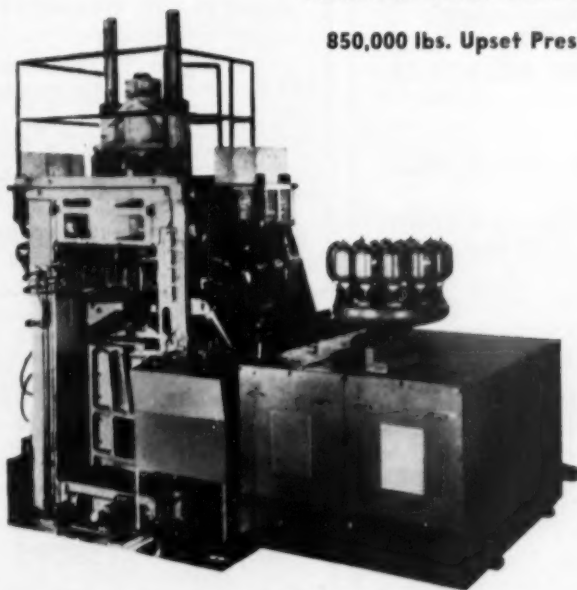
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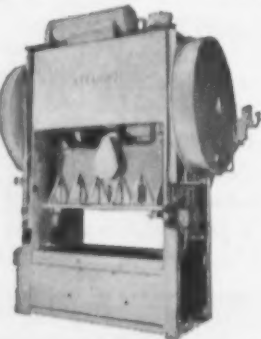
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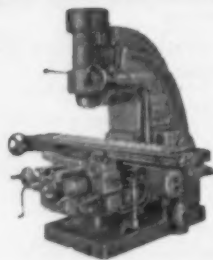
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- 36"x18" Putnam, m.d.
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Qu.	H.P.	Make	Type	Volts	R.P.M.
1	2000	G.E.	MT-12	6000	600
1	1500	Whas.	C.W.	6000	600
1	1200/1500	G.E.	MT-498	2300	357
1	750	G.E.	I-M	2200	400
1	600	G.E.	MT	2300	565
1	600	Whas.	C.W.	2200	444
1	600	G.E.	MT-30	2300	360
1	500	Al. Ch.	ANY	2200	505
1	500	G.E.	I-M	2300	430
1	400	G.E.	I-17-M	2200	875
1	400	G.E.	MT-424	440	360
1	400	Al. Ch.	ANY	2300	505
1	400	G.E.	MT-412	2200	440
1	300	G.E.	I-17-M	2200	380
1	200	G.E.	M-6335-H	2300	1200
1	250	Whas.	CW-937	440	1200
1	250	Al. Ch.	ANY	440	705
1	250	Whas.	CW	2200	450
1	250	G.E.	MT-414	2300	300
1	200	Whas.	CW	440	600
1	150	Al. Ch.	ANY	440	705
1	150	Al. Ch.	ANY	2200	600
1	150	G.E.	I-17-M	440	450
1	125	G.E.	I-15-M	2300	600
1	100	G.E.	I-14-M	2200	720
1	100	Whas.	CW	440	870

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Qu.	H.P.	Make	P.F.	Volts	R.P.M.
2	2100	G.E.	100	2300	360
2	2000	G.E.	80	2300	720
1	1750	G.E.	100	2300	360
1	1000	Whas.	80	2300	360
1	1000	Whas.	80	2300	225
1	800	El. Mch.	80	440	1200
1	750	G.E.	80	2300	450
2	700	G.E.	80	2300	1200
1	710	G.E.	80	2300	720
1	250	G.E.	45	440	600
1	250	G.E.	100	2300	514
2	300	Whas.	80	440	1200
1	187	G.E.	80	440	720
1	150	G.E.	100	2300	450
1	150	G.E.	100	550	600
1	150	Whas.	80	440	430
2	125	G.E.	80	4000/2300	1200
2	125	El. Mch.	100	4000/2300	800
1	125	G.E.	80	2300	900
2	100	Whas.	80	440	1800
1	100	Idéal	80	440	900
2	100	G.E.	80	440	600
1	100	El. Mch.	100	440	360

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1	2000	Whas.	MIII	600	230/460
2	1500	Whas.	Blw	600	800
1	1400	G.E.	MCF	600	63/180
1	1200	G.E.	MCF	600	750/950
1	940	Whas.	QJM	250	140/170
1	900	Whas.		250	450/550
1	820	Whas.		250	95/190
1	600	Al. Ch.		250	400/600
1	500	Whas.	CC-318	600	300/800
1	500	G.E.	MCF	250	300/800
2	450	Whas.		250	400/600
1	300	Rel.	18787	250	720
4	300	G.E.	CD-1808E	250	500/1500
1	200	Whas.	CB-3113	250	400/800
1	150	G.E.		600	250/750
1	150	Cr. Wh.	REE	230	1150
2	150	Cr. Wh.	REE-TRFCU	230	800
1	150	Whas.	RK-1518	230	900/1800
1	150	Whas.	RK-201	230	360/950
1	120	G.E.	MCF	230	250/1000
1	125	Whas.	RE-181	230	500/1500
1	125	Whas.	RK-183	230	850

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	3000/2400	G.E.	450	350/300	2300/4600
3	1750/2100	G.E.	514	350/300	2300/4600
1	1500	G.E.	500	350/300	11000
2	2000	G.E.	514	600	6600/13200
2	2000	G.E.	450	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	C.W.	514	90/115	4000/12000
1	1000	G.E.	900	300	6600
3	1000	G.E.	720	600	2300/4600
2	750	G.E.	720	275	2300/4600
1	750	C.W.	514	90/115	2300
1	600	G.E.	720	250	440/2300

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	5000	Whas.	OIBC	3	3300x26400
1	1500	Whas.	OIBC	3	26400/12200x460
2	2000	G.E.	HVDDJ	1	66000x13800
3	1000	G.E.	HVDDJ	1	5000x450
6	1000	Wagner	OIBC	1	13200x460
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100	G.E.	MFC	400/800
100	G.E.	BC-34	3500
100	G.E.	BC-19	575
100/150	G.E.	MCF	300/1000
75	G.E.	BCP-34	1750
75/25	West.	RK-151	400/1600
50/120	G.E.	MCF	250/1000
50	Cr. Wh.	CMC	700/1100
50	G.E.	DLC	650
35	West.	RK-150	350/1600
30	Cr. Wh.	CCM-504	450
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25	G.E.	BC-32	800
25	West.	RK-133	575
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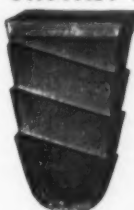


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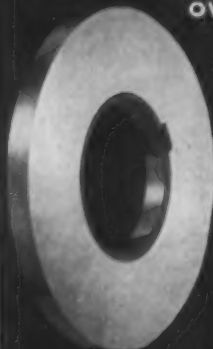
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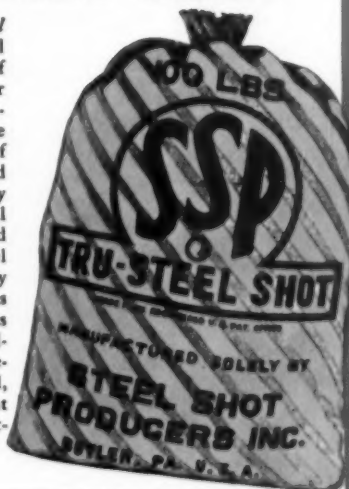
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Malleabasive is the *original* patented malleablized metal abrasive and the most widely used premium abrasive. Intermediately priced, Malleabasive provides lower overall blast cleaning costs in more varying types of blast cleaning conditions than any other metal abrasive. Malleabasive has been widely imitated, but genuine Malleabasive is manufactured under the complete Malleabasive process used by our organization only, providing Malleabasive's unique and distinctive metallurgical structure.



*U.S. Pat. # 2184926 (other patents pending)

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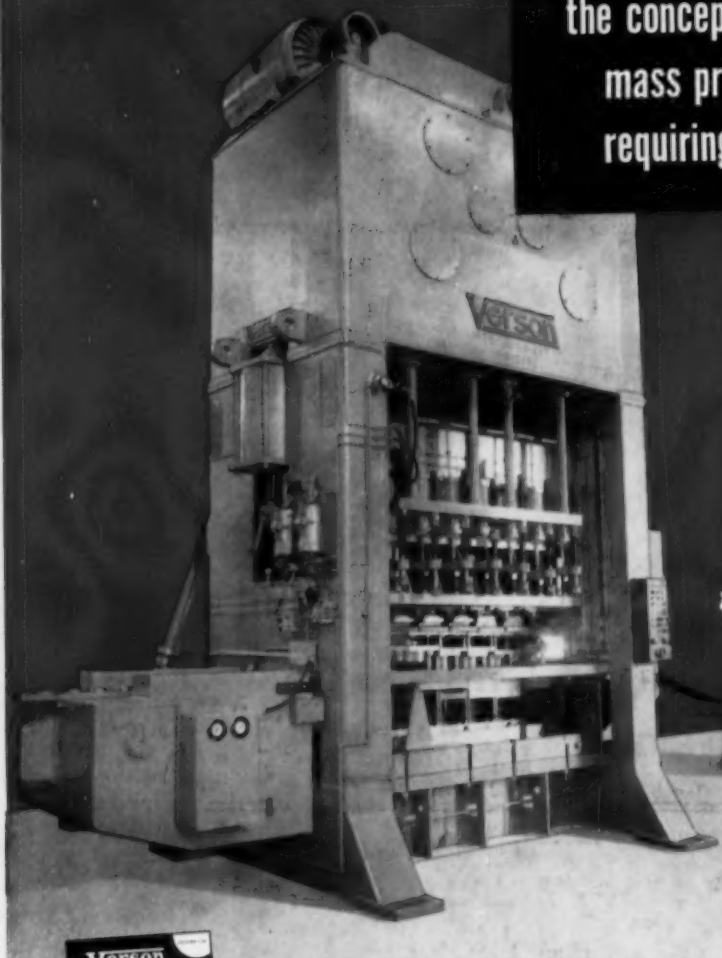
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